

**Chapter 296-155 WAC**  
**SAFETY STANDARDS FOR CONSTRUCTION**  
**WORK**

**WAC**

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- 296-155-135 First-aid room. [Order 74-26, § 296-155-135, filed 5/7/74, effective 6/6/74.] Repealed by 00-01-038, filed 12/7/99, effective 2/1/00. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-17335 Effective date. [Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17335, filed 2/3/93, effective 3/15/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-17349 Appendix E to WAC 296-155-173—Methylenedianiline—Qualitative and quantitative fit testing procedures. [Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17349, filed 2/3/93, effective 3/15/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-17351 Appendix E-1—Qualitative protocols. [Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17351, filed 2/3/93, effective 3/15/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-17353 Appendix E-1-a—Isoamyl acetate (banana oil) protocol. [Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17353, filed 2/3/93, effective 3/15/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-17355 Appendix E-1-b—Saccharin solution aerosol protocol. [Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17355, filed 2/3/93, effective 3/15/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-17357 Appendix E-1-c—Irritant fume protocol. [Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17357, filed 2/3/93, effective 3/15/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-17359 Appendix E-2—Quantitative fit test procedures. [Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17359, filed 2/3/93, effective 3/15/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.
- 296-155-175 Scope and application. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-175, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17505 Definitions. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17505, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17510 Permissible exposure limits (pel). [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17510, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17515 Communication among employers. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17515, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17520 Identification. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17520, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17525 Regulated areas. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17525, filed 4/27/87.] Repealed by 87-24-

	051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.		49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-181, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-17530	Exposure monitoring. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17530, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-183	Appendix D—Medical questionnaires—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.-040. 87-10-008 (Order 87-06), § 296-155-183, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-17532	Methods of compliance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17532, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-185	Appendix E—Interpretation and classification of chest roentgenograms—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-185, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-17535	Respiratory protection. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17535, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-187	Appendix F—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-187, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-17540	Protective clothing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17540, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-189	Appendix G—Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-189, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-17545	Hygiene facilities and practices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17545, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-191	Appendix H—Substance technical information for asbestos—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-191, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-17550	Communication of hazards to employees. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17550, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-193	Appendix I—Medical surveillance guidelines for asbestos, tremolite, anthophyllite, and actinolite—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-193, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-17555	Housekeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17555, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-225	Safety belts, droplines, lifelines, and lanyards. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-225, filed 1/21/86; Order 74-26, § 296-155-225, filed 9/30/76; Order 74-26, § 296-155-225, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-17560	Medical surveillance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17560, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-229	Qualified person—Rigging. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-13-069, § 296-155-229, filed 6/15/98, effective 8/15/98.] Decodified by 98-16-067, filed 8/4/98, effective 8/4/98. Later promulgation, see WAC 296-155-329.
296-155-17565	Recordkeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17565, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-230	Safety nets. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-230, filed 1/21/86; Order 74-26, § 296-155-230, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-17570	Dates. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17570, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-300	Accident prevention signs and tags. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-06-075, § 296-155-300, filed 3/4/03, effective 8/1/03. Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-300, filed 9/22/93, effective 11/1/93; 93-01-067 (Order 92-15), § 296-155-300, filed 12/11/92, effective 1/15/93. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-300, filed 1/21/86; Order 74-26, § 296-155-300, filed 5/7/74, effective 6/6/74.] Repealed by 04-18-080, filed 8/31/04, effective 11/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see WAC 296-800-11045.
296-155-17575	Appendices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17575, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.	296-155-425	Definitions applicable to this part. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-425, filed 1/21/86; Order 74-26, § 296-155-425, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
296-155-17635	Startup dates. [Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17635, filed 10/29/93, effective 12/10/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.	296-155-430	General requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-430, filed 1/21/86; Order 77-20, § 296-155-
296-155-17656	Appendix D to WAC 296-155-176—Qualitative and quantitative fit test protocols. [Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17656, filed 10/29/93, effective 12/10/93.] Repealed by 99-10-071, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050.		
296-155-177	Appendix A—WISHA reference method—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-177, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.		
296-155-179	Appendix B—Detailed procedure for asbestos, tremolite, anthophyllite, and actinolite sampling and analysis—Nonmandatory. [Statutory Authority: RCW 49.17.-050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-179, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.		
296-155-181	Appendix C—Qualitative and quantitative fit testing procedures—Mandatory. [Statutory Authority: RCW		

- 430, filed 10/18/77; Order 77-12, § 296-155-430, filed 7/11/77; Order 74-26, § 296-155-430, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-435 Grounding and bonding. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-435, filed 1/21/86; Order 74-26, § 296-155-435, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-440 Equipment installation and maintenance. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-440, filed 1/21/86; Order 74-26, § 296-155-440, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-450 Battery rooms and battery charging. [Order 74-26, § 296-155-450, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-455 Hazardous locations. [Order 74-26, § 296-155-455, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-480 Fixed ladders. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-155-480, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-480, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-480, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-480, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-480, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-480, filed 1/10/91, effective 2/12/91; 90-09-026 (Order 90-01), § 296-155-480, filed 4/10/90, effective 5/25/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-480, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-480, filed 7/31/79; Order 76-29, § 296-155-480, filed 9/30/76; Order 74-26, § 296-155-480, filed 5/7/74, effective 6/6/74.] Repealed by 06-16-020, filed 7/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-48060 Training requirements. [Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-48060, filed 11/22/91, effective 12/24/91.] Repealed by 06-16-020, filed 7/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-48080 Appendix A. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-155-48080, filed 10/4/05, effective 1/1/06. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-48080, filed 11/22/91, effective 12/24/91.] Repealed by 06-16-020, filed 7/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-48090 Reserved. [Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-48090, filed 11/22/91, effective 12/24/91; Order 76-29, Table J-18 (codified as WAC 296-155-48090), filed 9/30/76; Order 76-6, Table J-18, filed 3/1/76. Formerly 296-155-480 (part).] Repealed by 06-16-020, filed 7/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, 49.17.-040, 49.17.050, 49.17.060.
- 296-155-481 Scope and application. [Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060. 98-05-046, § 296-155-481, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-481, filed 11/22/91, effective 12/24/91.] Repealed by 06-19-073, filed 9/19/06, effective 1/1/07. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-482 Definitions applicable to this part. [Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060. 98-05-046, § 296-155-482, filed 2/13/98, effective 4/15/98.] Repealed by 06-19-073, filed 9/19/06, effective 1/1/07. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-483 General requirements. [Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050. 00-14-058, § 296-155-483, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060. 98-05-046, § 296-155-483, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-483, filed 11/22/91, effective 12/24/91.] Repealed by 05-01-054, filed 12/7/04, effective 3/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-484 Additional requirements applicable to specific types of scaffolds. [Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060. 98-05-046, § 296-155-484, filed 2/13/98, effective 4/15/98.] Repealed by 05-01-054, filed 12/7/04, effective 3/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-485 Reserved. [Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060. 98-05-046, § 296-155-485, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-485, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-485, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-485, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-485, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-485, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-485, filed 1/11/90, effective 2/6/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-485, filed 1/21/86; 82-08-026 (Order 82-10), § 296-155-485, filed 3/30/82. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-485, filed 7/31/79; Order 76-29, § 296-155-485, filed 9/30/76; Order 76-6, § 296-155-485, filed 3/1/76; Order 74-26, § 296-155-485, filed 5/7/74, effective 6/6/74.] Repealed by 05-01-054, filed 12/7/04, effective 3/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
- 296-155-48501 Figure J-1. [Order 76-29, Figure J-1 (codified as WAC 296-155-48501), filed 9/30/76; Order 74-26, § 296-155-485 (part), Figure J-1, filed 5/7/74, effective 6/6/74.] Repealed by 82-08-026 (Order 82-10), filed 3/30/82. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-48502 Figure J-2. [Order 76-29, Figure J-2 (codified as WAC 296-155-48502), filed 9/30/76; Order 74-26, § 296-155-485 (part), Figure J-2, filed 5/7/74, effective 6/6/74.] Repealed by 82-08-026 (Order 82-10), filed 3/30/82. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-48503 Table J-1. [Order 76-29, Table J-1 (codified as WAC 296-155-48503), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-1, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060.
- 296-155-48504 Table J-2. [Order 76-29, Table J-2 (codified as WAC 296-155-48504), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-2, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060.
- 296-155-48505 Table J-3. [Order 76-29, Table J-3 (codified as WAC 296-155-48505), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-3, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060.
- 296-155-48506 Table J-4. [Order 76-29, Table J-4 (codified as WAC 296-155-48506), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-4, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060.
- 296-155-48507 Table J-5. [Order 76-29, Table J-5 (codified as WAC 296-155-48507), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-5, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060.
- 296-155-48508 Table J-6. [Order 76-29, Table J-6 (codified as WAC 296-155-48508), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-6, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050 and [49.17.]060.

296-155-48509	Table J-7. [Order 76-29, Table J-7 (codified as WAC 296-155-48509), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-7, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.		Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48527, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
296-155-48510	Table J-8. [Order 76-29, Table J-8 (codified as WAC 296-155-48510), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-8, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-48529	Boom supported elevating work platforms. [Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-155-48529, filed 8/10/92, effective 9/10/92; 91-03-044 (Order 90-18), § 296-155-48529, filed 1/10/91, effective 2/12/91; 89-11-035 (Order 89-03), § 296-155-48529, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48529, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
296-155-48511	Table J-9. [Order 76-29, Table J-9 (codified as WAC 296-155-48511), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-9, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-48531	Vehicle mounted elevating and rotating aerial devices. [Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-48531, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-48531, filed 7/20/94, effective 9/20/94; 92-17-022 (Order 92-06), § 296-155-48531, filed 8/10/92, effective 9/10/92; 91-03-044 (Order 90-18), § 296-155-48531, filed 1/10/91, effective 2/12/91; 90-17-051 (Order 90-10), § 296-155-48531, filed 8/13/90, effective 9/24/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48531, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
296-155-48512	Table J-10. [Order 76-29, Table J-10 (codified as WAC 296-155-48512), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-10, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-48533	Crane or derrick suspended personnel platforms. [Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-48533, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-48533, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-48533, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-48533, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-48533, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-48533, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48533, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
296-155-48513	Table J-11. [Order 76-29, Table J-11 (codified as WAC 296-155-48513), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-11, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-48536	Forklift elevated work platforms. [Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-48536, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-48536, filed 5/15/89, effective 6/30/89.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
296-155-48514	Table J-12. [Order 76-29, Table J-12 (codified as WAC 296-155-48514), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-12, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-487	Manually propelled elevating work platforms. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-155-487, filed 6/29/04, effective 1/1/05; 98-05-046, § 296-155-487, filed 2/13/98, effective 4/15/98.] Repealed by 06-19-073, filed 9/19/06, effective 1/1/07. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
296-155-48515	Table J-13. [Order 76-29, Table J-13 (codified as WAC 296-155-48515), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-13, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-488	Self propelled elevating work platforms. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-155-488, filed 6/29/04, effective 1/1/05; 98-05-046, § 296-155-488, filed 2/13/98, effective 4/15/98.] Repealed by 06-19-073, filed 9/19/06, effective 1/1/07. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
296-155-48516	Table J-14. [Order 76-29, Table J-14 (codified as WAC 296-155-48516), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-14, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-489	Boom supported elevating work platforms. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-489, filed 2/13/98, effective 4/15/98.] Repealed by 06-19-073, filed 9/19/06, effective 1/1/07. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
296-155-48517	Table J-15. [Order 76-29, Table J-15 (codified as WAC 296-155-48517), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-15, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-490	Aerial lifts. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-490, filed 2/13/98, effective 4/15/98.] Repealed by 06-19-073, filed 9/19/06, effective 1/1/07. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
296-155-48518	Table J-16. [Order 76-29, Table J-16 (codified as WAC 296-155-48518), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-16, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.	296-155-493	Training. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-493, filed 2/13/98, effective 4/15/98.]
296-155-48519	Table J-17. [Order 76-29, Table J-17 (codified as WAC 296-155-48519), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-17, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.		
296-155-48523	Manually propelled mobile ladder stands and scaffolds (towers). [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-48523, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48523, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.		
296-155-48525	Manually propelled elevating work platforms. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-74 (Order 86-14), § 296-155-48525, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.		
296-155-48527	Self propelled elevating work platforms. [Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-155-48527, filed 8/10/92, effective 9/10/92.		

	Repealed by 05-01-054, filed 12/7/04, effective 3/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.		49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61705, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.
296-155-494	Non-Mandatory Appendix A to Part J-1, Scaffold Specifications. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-494, filed 2/13/98, effective 4/15/98.] Repealed by 05-01-054, filed 12/7/04, effective 3/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.		
296-155-496	Non-Mandatory Appendix C to Part J-1, List of National Consensus Standards. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-496, filed 2/13/98, effective 4/15/98.] Repealed by 06-19-073, filed 9/19/06, effective 1/1/07. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.	296-155-61707	Tire servicing equipment. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61707, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.
296-155-497	Non-Mandatory Appendix D to Part J-1, List of Training Topics for Scaffold Erectors and Dismantlers. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-497, filed 2/13/98, effective 4/15/98.] Repealed by 05-01-054, filed 12/7/04, effective 3/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.	296-155-61709	Wheel component acceptability. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61709, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.
296-155-498	Non-Mandatory Appendix E to Part J-1, Drawings and Illustrations. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-498, filed 2/13/98, effective 4/15/98.] Repealed by 05-01-054, filed 12/7/04, effective 3/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.	296-155-61711	Safe operating procedure—Multipiece rim wheels. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-61711, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61711, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.
296-155-50501	Appendix—Roofs. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-50501, filed 6/17/81.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.	296-155-61713	Safe operating procedure—Single-piece rim wheels. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-61713, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61713, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.
296-155-575	Helicopters and helicopter cranes. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-155-575, filed 8/8/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-575, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-575, filed 1/21/86; Order 76-28, § 296-155-575, filed 9/28/76; Order 74-26, § 296-155-575, filed 5/7/74, effective 6/6/74.] Repealed by 04-09-099, filed 4/20/04, effective 9/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see chapter 296-829 WAC.	296-155-65505	Sewage piping system. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-65505, filed 1/21/86.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-576	Figure L-1. [Order 74-26, Figure L-1 (codified as WAC 296-155-576), filed 5/7/74, effective 6/6/74. Formerly WAC 296-155-575 (part).] Repealed by 04-09-099, filed 4/20/04, effective 9/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see chapter 296-829 WAC.	296-155-660	Specific excavation requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-660, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-660, filed 6/17/81; Order 76-29, § 296-155-660, filed 9/30/76; Order 74-26, § 296-155-660, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-580	Aerial lifts. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-580, filed 1/21/86; Order 74-26, § 296-155-580, filed 5/7/74, effective 6/6/74.] Repealed by 90-17-051 (Order 90-10), filed 8/13/90, effective 9/24/90. Statutory Authority: Chapter 49.17 RCW.	296-155-66005	Borrow pits. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66005, filed 1/21/86.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-617	Servicing multipiece and single-piece rim wheels. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-617, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.	296-155-665	Specific trenching requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-665, filed 1/21/86; 85-10-004 (Order 85-09), § 296-155-665, filed 4/19/85. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-665, filed 6/17/81; Order 77-12, § 296-155-665, filed 7/11/77; Order 76-29, § 296-155-665, filed 9/30/76; Order 74-26, § 296-155-665, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-61701	Scope. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61701, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.	296-155-66501	Table N-1. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66501, filed 1/21/86; 82-13-045 (Order 82-22), § 296-155-66501, filed 6/11/82; Order 76-29, Table N-1 (codified as WAC 296-155-66501), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-1, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-61703	Definitions. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61703, filed 1/21/86.] Repealed by 04-20-079, filed 10/5/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-864 WAC.	296-155-66502	Table N-2. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66502, filed 1/21/86; Order 76-29, Table N-2 (codified as WAC 296-155-66502), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-2, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
296-155-61705	Employee training. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-61705, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW		

296-155-66503	Table N-3. [Order 76-29, Table N-3 (codified as WAC 296-155-66503), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-3, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.	296-155-855	03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050. General provisions. [Order 74-26, § 296-155-855, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-66504	Table N-4. [Order 76-29, Table N-4 (codified as WAC 296-155-66504), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-4, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.	296-155-860	Blaster qualifications. [Order 74-26, § 296-155-860, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-66505	Table N-5. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-66505, filed 6/17/81; Order 76-29, Table N-5 (codified as WAC 296-155-66505), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-5, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.	296-155-865	Surface transportation of explosives. [Order 74-26, § 296-155-865, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-692	Requirements for lift-slab operations. [Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-692, filed 5/15/89, effective 6/30/89.] Repealed by 90-03-029 (Order 89-20), filed 1/11/90, effective 2/26/90. Statutory Authority: Chapter 49.17 RCW.	296-155-870	Underground transportation of explosives. [Order 74-26, § 296-155-870, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-700	General requirements. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-700, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-700, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-700, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-700, filed 1/21/86; Order 76-29, § 296-155-700, filed 9/30/76; Order 74-26, § 296-155-700, filed 5/7/74, effective 6/6/74.] Repealed by 02-13-115, filed 6/19/02, effective 9/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-155-875	Storage of explosives and blasting agents. [Order 74-26, § 296-155-875, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-705	Flooring requirements. [Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-705, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-705, filed 1/21/86; Order 76-29, § 296-155-705, filed 9/30/76; Order 74-26, § 296-155-705, filed 5/7/74, effective 6/6/74.] Repealed by 02-13-115, filed 6/19/02, effective 9/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-155-880	Loading of explosives or blasting agents. [Order 74-26, § 296-155-880, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-710	Structural steel assembly. [Order 74-26, § 296-155-710, filed 5/7/74, effective 6/6/74.] Repealed by 02-13-115, filed 6/19/02, effective 9/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-155-885	Initiation of explosive charges—Electric blasting. [Order 74-26, § 296-155-885, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-715	Bolting, riveting, fitting-up, and plumbing-up. [Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-715, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-715, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-715, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-715, filed 9/30/76; Order 74-26, § 296-155-715, filed 5/7/74, effective 6/6/74.] Repealed by 02-13-115, filed 6/19/02, effective 9/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-155-890	Use of safety fuse. [Order 76-29, § 296-155-890, filed 9/30/76; Order 74-26, § 296-155-890, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-720	Safe walking surfaces on structural members. [Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-720, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-720, filed 1/21/86; Order 74-26, § 296-155-720, filed 5/7/74, effective 6/6/74.] Repealed by 02-13-115, filed 6/19/02, effective 9/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-155-895	Use of detonating cord. [Order 74-26, § 296-155-895, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-750	Masonry construction. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-750, filed 1/21/86; Order 74-26, § 296-155-750, filed 5/7/74, effective 6/6/74.] Repealed by 89-11-035 (Order 89-03), filed 5/15/89, effective 6/30/89. Statutory Authority: Chapter 49.17 RCW.	296-155-900	Firing the blast. [Order 74-26, § 296-155-900, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-760	Concrete finishing. [Order 74-26, § 296-155-760, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.	296-155-905	Inspection after blasting. [Order 74-26, § 296-155-905, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-155-850	Definitions applicable to this part. [Order 74-26, § 296-155-850, filed 5/7/74, effective 6/6/74.] Repealed by 86-	296-155-910	Misfires. [Order 74-26, § 296-155-910, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
		296-155-915	Underwater blasting. [Order 74-26, § 296-155-915, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
		296-155-920	Blasting in excavation work under compressed air. [Order 74-26, § 296-155-920, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.

**Reviser's note:** Order 74-26, filed May 7, 1974, both repealed chapter 296-40 WAC, entitled "Safety Standards—Construction Work," and adopted this new chapter as a replacement. The effective date of this order is June 6, 1974.

## PART A GENERAL SAFETY AND HEALTH PROVISIONS

**WAC 296-155-001 Foreword.** (1) This chapter has been compiled with the purpose of consolidating safety and health construction safety standards into one chapter of the Washington Administrative Code, by the promulgation of the standards contained herein. It is also the intent that the safety standards of the Washington state department of labor and industries, will be at least as effective as those adopted by the U.S. Department of Labor and administered by the Occupational Safety and Health Administration as published in the

Code of Federal Regulations. The department of labor and industries is incorporating many of the preexisting construction safety standards and adding new standards under this chapter.

(2) Attention is called to the fact that certain Washington state standards contain standards and/or regulations applicable to all industries. These include, but are not limited to: The code for boilers and pressure vessels; the code for pressure piping; the general industrial safety and health standards; the general occupational health standards; regulations of the department of social and health services.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-001, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-001, filed 9/30/76; Order 74-26, § 296-155-001, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-003 Subsections, subdivisions, items, subitems, and segments.** (1) That portion of section numbering appearing after the chapter designation appears in either a three digit or a five digit format (e.g. WAC 296-24-330 and 296-24-30002). The final two digits of the section number are implied decimal extensions of the first three digits and represent a further division of the three digit enumeration.

(2) Sections of this chapter may be divided into subsections (1), (2), (3), etc., which may in turn be divided into subdivisions (a), (b), (c), etc., which may be further divided into items (i), (ii), (iii), etc., which may be further divided into subitems (A), (B), (C), etc., which may be further divided into segments (aa) [(I)], (bb) [(II)], (cc) [(III)], etc., all according to the following hierarchy, e.g.

Sections	296-24-330 and 296-24-33002
Subsections	(1) (2)
Subdivisions	(a) (b)
Items	(i) (ii)
Subitems	(A) (B)
Segments	I II

Note: "Part" as used in this standard means a major division of this chapter relating to a specific topic or topics and containing various related sections.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-003, filed 1/21/86; Order 74-26, § 296-155-003, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-005 Purpose and scope.** (1) The standards included in this chapter apply throughout the state of Washington, to any and all work places subject to the Washington Industrial Safety and Health Act (chapter 49.17 RCW), where construction, alteration, demolition, related inspection, and/or maintenance and repair work, including painting and decorating, is performed. These standards are minimum safety requirements with which all industries must comply when engaged in the above listed types of work.

(2) If a provision of this chapter conflicts with a provision of the general safety and health standard (chapter 296-24 WAC), the general occupational health standard (chapter 296-62 WAC), or the safety and health core rules (chapter

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296-800 WAC), the provision of this chapter shall prevail. When a provision of this chapter conflicts with a provision of another vertical safety standard applying to the place of work, the provisions of the vertical standard of specific application shall prevail.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-005, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-005, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-155-005, filed 11/13/80; Order 76-29, § 296-155-005, filed 9/30/76; Order 74-26, § 296-155-005, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-006 Equipment approval by nonstate agency or organization.** Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the department of labor and industries, such as the Underwriters Laboratories or the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), shall be utilized, that provision shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provisions of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-006, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-006, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-007 Incorporation of standards of national organization.** Whenever a provision of this chapter incorporates by reference a national code or portion thereof which has been adopted by and is currently administered by another state agency, compliance with those provisions adopted and administered by such other state agency, if from a more recent edition of such national code, will be deemed to be prima facie evidence of compliance with the provisions of this chapter.

[Order 74-26, § 296-155-007, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-008 Incorporation of standards of federal agency.** (1) Whenever a provision of this chapter incorporates therein provisions of the Code of Federal Regulations (CFR) and changes thereto, or any other regulations adopted by an agency of the federal government, that provision of this chapter shall be construed to mean that compliance with such regulations shall be prima facie evidence of compliance with the provisions of this chapter.

(2) Whenever a provision of this chapter incorporates therein provisions of the Code of Federal Regulations, the provisions so incorporated shall be those in effect on the date of effectiveness of this chapter, unless the content of the incorporating section specifies otherwise.

[Order 76-29, § 296-155-008, filed 9/30/76; Order 74-26, § 296-155-008, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-009 Equipment whether or not owned by, or under control of the employer.** (1) It is the employer's responsibility to ensure that any defective equipment or tools are not used.

(2) When any tool or piece of equipment fails to meet the requirements of any safety standard or recognized safe practice, the tool or equipment shall not be used.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-009, filed 1/21/86.]

**WAC 296-155-010 Variance and procedure.** Realizing that conditions may exist in operations under which certain state standards will not have practical application, the director of the department of labor and industries or his/her authorized representative may, pursuant to this section, sections eight or nine of the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973, RCW 49.17.080 and 49.17.090) and appropriate administrative rules of this state and the department of labor and industries and upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other means of providing an equivalent measure of protection are afforded. Such variation granted shall be limited to the particular case or cases covered in the application for variance and may be revoked for cause. The order granting a variance shall be conspicuously posted on the premises and shall remain posted during the time it is in effect. A copy of the variance shall be available at the work site. All requests for variances from safety and health standards included in this chapter, shall be made in writing to the director of the department of labor and industries at Olympia, Washington, or his/her duly authorized representative, Department of Labor and Industries, P.O. Box 44600, Olympia, Washington 98504-4600.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-010, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-010, filed 1/21/86; Order 74-26, § 296-155-010, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-012 Definitions applicable to all sections of this chapter.**

Note: Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section. Certain parts of this chapter contain definitions as they apply to that particular part.

"Approved" means approved by the director of the department of labor and industries or his/her authorized representative: Provided, however, That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the bureau of mines, the provisions of WAC 296-155-006 shall apply.

"Assistant director" means the individual in charge of the division of consultation and compliance, department of labor and industries, or an authorized representative.

"Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or be at a specific location or locations at the workplace.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

"Confined space" means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and

(3) Is not designed for continuous employee occupancy.

"Construction work" shall mean and include all or any part of excavation, construction, erection, alteration, repair, demolition, and dismantling, of buildings and other structures and all operations in connection therewith; the excavation, construction, alteration and repair of sewers, trenches, caissons, conduits, pipe lines, roads and all operations pertaining thereto; the moving of buildings and other structures, and to the construction, alteration, repair, or removal of wharfs, docks, bridges, culverts, trestles, piers, abutments or any other construction, alteration, repair or removal work related thereto.

"Defect" means any characteristic or condition which tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

"Department" means the department of labor and industries.

"Designated person" means "authorized person" as defined in this section.

"Director" means the director of the department of labor and industries, or his/her designated representative.

"Division" means the division of consultation and compliance of the department.

"Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: Provided, that any person, partnership, or business entity not having employees, and who is covered by the industrial insurance act shall be considered both an employer and an employee.

"Equipment" means all machinery, devices, tools, facilities, safeguards, and protective construction used in connection with construction operations.

"Ground fault circuit interrupter" means a fast acting circuit breaker that is sensitive to very low levels of current leakage to ground. The device is designed to limit the electric shock to a current and time duration below that which can cause serious injury.

"Hazard" means that condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

"Hazardous substance" means a substance which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, is likely to cause death or injury.

"Maintenance" means the work of keeping a building, machine, roadway, etc., in a state of good repair.

"Part" means a major division, of this chapter, relating to a specific topic or topics and containing various sections, subsections, etc.

"Permit-required confined space (permit space)" means a confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

"Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work, or the project.

"Repair" means to restore a building, machine, roadway, etc., to an original state after damage or decay.

"Safety factor" means the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

"Safety and health standard" means a standard which requires the adoption or use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

"Shall" means that the provision(s) of the standard are mandatory.

"Substantial" means constructed of such strength, of such material, and of such workmanship, that the object referred to will withstand all normal wear, shock and usage.

"Standard safeguard" means a device designed and constructed with the object of removing the hazard of accident incidental to the machine, appliance, tool, building, or equipment to which it is attached.

Standard safeguards shall be constructed of either metal or wood or other suitable material or a combination of these. The final determination of the sufficiency of any safeguard rests with the director of the department of labor and industries through the division of consultation and compliance.

"Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

"Working day" means a calendar day, except Saturdays, Sundays, and legal holidays as set forth in RCW 1.16.050, as now or hereafter amended, and for the purposes of the computation of time within which an act is to be done under the provisions of this chapter, shall be computed by excluding the first working day and including the last working day.

"Worker," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, mean an employee of an employer who is employed in the business of their employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is their personal labor for an employer whether by manual labor or otherwise.

"Work place" means any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control, and includes, but is not limited to, all work places covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

Abbreviations used in this chapter:

"ANSI" means American National Standards Institute.

"API" means American Petroleum Institute.

"ASA" means American Standards Association.

"ASAE" means American Society of Agricultural Engineers.

"ASHRE" means American Society of Heating and Refrigeration Engineers.

"ASME" means American Society of Mechanical Engineers.

"ASTM" means American Society of Testing and Materials.

"AWS" means American Welding Society.

"BTU" means British thermal unit.

"BTUH" means British thermal unit per hour.

"CFM" means cubic feet per minute.

"CFR" means Code of Federal Register.

"CGA" means Compressed Gas Association.

"CIE" means Commission Internationale de l' Eclairage.

"DOT" means department of transportation.

"FRP" means fiberglass reinforced plastic.

"GPM" means gallons per minute.

"ICC" means Interstate Commerce Commission.

"ID" means inside diameter.

"LPG" means liquefied petroleum gas.

"MCA" means Manufacturing Chemist Association.

"MSHA" means United States Department of Labor, Mine Safety and Health Administration.

"NBFU" means National Board of Fire Underwriters.

"NEMA" means National Electrical Manufacturing Association.

"NFPA" means National Fire Protection Association.

"NTP" means normal temperature and pressure.

"OD" means outside diameter.

"PSI" means pounds per square inch.

"PSIA" means pounds per square inch absolute.

"PSIG" means pounds per square inch gauge.

"RMA" means Rubber Manufacturers Association.

"SAE" means Society of Automotive Engineers.

"TFI" means The Fertilizer Institute.

"TSC" means Trailer Standard Code.

"UL" means Underwriters' Laboratories, Inc.

"USASI" means United States of America Standards Institute.

"USC" means United States Code.

"USCG" means United States Coast Guard.

"WAC" means Washington Administrative Code.

"WISHA" means Washington Industrial Safety and Health Act of 1973.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-012, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-012, filed 1/21/86; Order 74-26, § 296-155-012, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-015 Education and first-aid standards.** It shall be the duty of every employer to comply with such standards and systems of education for safety as shall be, from time to time, prescribed for such employer by the director of labor and industries or by statute. Refer to WAC 296-155-100 through 296-155-135 for additional requirements.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-015, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-015, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-020 Housekeeping.** (1) All places of employment shall be kept clean to the extent that the nature of the work allows.

(2) To facilitate cleaning, every floor, working surface, and passageway shall be kept free from protruding nails, splinters, loose boards or openings.

(3) Cleaning and sweeping shall be performed in such a manner as to minimize the contamination of the air with dust.

(4) In areas where workers may pass or perform duties, all debris and accumulations of material shall be removed. Hoses and electrical conductors across aisles or passageways shall be covered or suspended overhead so that there is no tripping hazard.

(5) Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passages must be made. Such aisles and passageways shall be marked.

(6) Storage of material shall not create a hazard. Bags, containers, bundles, construction materials and other equipment shall be stored in tiers, stacked, blocked or interlocked. They shall be limited in height so that they are stable and secure against falling, sliding, or collapse.

(7) Free access shall be maintained at all times to all exits, fire alarm boxes, fire extinguishing equipment, and any other emergency equipment. Free access means clear of all obstructions.

(8) Working and storage areas shall be kept free from accumulation of materials that pose hazards of tripping, fire, explosion, or pest harborage. Vegetation control shall be exercised.

(9) All lunchrooms, washrooms and restrooms shall be kept in a clean and sanitary condition. Garbage cans in lunchrooms and restrooms shall be equipped with fitted covers and the contents disposed of daily.

(10) During the course of construction, alteration, repair or demolition of buildings and structures, employers shall ensure continuous clean-up of their work area, including removal of all rubble, scrap, boxes, crates and excess material to trash disposal areas.

(11) Containers shall be provided for the collection and separation of waste, trash, oily or used rags, and other refuse. Containers used for garbage and other oily, flammable or hazardous wastes, such as caustics, acids, harmful dusts or similar materials shall be equipped with covers. Common garbage and other waste shall be disposed of at frequent and regular intervals. Chemical agents or substances which might react to create a hazardous condition shall be stored and disposed of separately. All hazardous wastes which are subject to the requirements of chapter 173-303 WAC shall be han-

dled, accumulated and disposed of in accordance with that chapter.

(12) All floors and walkways shall be maintained in good condition. Loose or broken components shall be repaired or replaced. Secure footing shall be ensured on all floors and walkways.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-020, filed 1/21/86; Order 74-26, § 296-155-020, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-030 Acceptable certifications.** (1) Pressure vessels. Current and valid certification by an insurance company or regulatory authority shall be deemed as acceptable evidence of safe installation, inspection, testing of pressure vessels provided by the employer.

(2) Boilers. Boilers provided by the employer shall be deemed to be in compliance with the requirements of this section when evidence of current and valid certification by an insurance company or regulatory authority attesting to the safe installation, inspection, and testing is presented.

(3) Other requirements. Regulations prescribing specific requirements for other types of pressure vessels and similar equipment are contained in Parts D and M of this chapter.

[Order 74-26, § 296-155-030, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-035 General requirements.** (1) The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirements of this chapter is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

(2) The employer shall permit only those employees qualified by training or experience to operate equipment and machinery.

(3) Employees shall use safeguards provided for their protection.

(4) Suitable clothing shall be worn for the job. Sufficient and proper clothing shall be worn to assist in preventing scratches, abrasions, slivers, sunburn, hot liquid burns, or similar hazards. Loose or ragged clothing, scarfs or ties shall not be worn while working around moving machinery.

(5) Where work is in progress above workers, a catch platform or other means shall be provided to protect those working below. All workers shall be notified. One completed floor shall be maintained between workers and steel or concrete work above.

(6) Employees shall report to their employers the existence of any unsafe equipment or method or any other hazard which, to their knowledge is unsafe and where such unsafe equipment or method or other hazard exists in violation of this chapter it shall be corrected.

(7) Nothing herein contained shall prevent the use of existing equipment during its lifetime provided it shall be properly safeguarded, maintained in good condition, be in conformity with applicable safety and health standards, and shall conform to safety factors for the material used, as herein provided.

(8) As construction progresses, the component parts of structures shall be secured or braced to prevent collapse or failure.

(9) Prompt and safe removal of injured employees from elevated work locations, trenches and excavations shall be ensured prior to commencement of work.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-035, filed 1/21/86; Order 74-26, § 296-155-035, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-040 Safe place standards.** (1) Each employer shall furnish to each employee a place of employment free from recognized hazards that are causing or likely to cause serious injury or death to employees.

(2) Every employer shall require safety devices, furnish safeguards, and shall adopt and use practices, methods, operations, and processes which are reasonably adequate to render such employment and place of employment safe. Every employer shall do everything reasonably necessary to protect the life and safety of employees.

(3) No employer shall require any employee to go or be in any employment or place of employment which is hazardous to the employee.

(4) No employer shall fail or neglect:

(a) To provide and use safety devices and safeguards.

(b) To adopt and use methods and processes reasonably adequate to render the employment and place of employment safe.

(c) To do everything reasonably necessary to protect the life and safety of employees.

(5) No employer, owner, or lessee of any real property shall construct or cause to be constructed any place of employment that is hazardous to the employee.

(6) No person shall do any of the following:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice, or warning, furnished for use in any employment or place of employment.

(b) Interfere in any way with the use thereof by any other person.

(c) Interfere with the use of any method or process adopted for the protection of any employee, including themselves, in such employment, or place of employment.

(d) Fail or neglect to do everything reasonably necessary to protect the life and safety of employees.

(7) The use of intoxicants or debilitating drugs while on duty is prohibited. Employees under the influence of intoxicants or drugs shall not be permitted in or around worksites. This subsection (7) shall not apply to employees taking prescription drugs or narcotics as directed and prescribed by a physician, provided such use does not endanger the employee or others.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-040, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-040, filed 5/7/74, effective 6/6/74.]

## PART B-1 OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

**WAC 296-155-100 Management's responsibility.** (1) It shall be the responsibility of management to establish, supervise, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment.

(b) An accident prevention program as required by these standards.

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health.

(2) Employees required to handle or use poisons, caustics, and other harmful substances shall be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required.

(3) In job site areas where harmful plants or animals are present, employees who may be exposed shall be instructed regarding the potential hazards, and how to avoid injury, and the first-aid procedures to be used in the event of injury.

(4) Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in Parts B, D, and other applicable parts of this standard.

(5) Permit-required confined spaces. The requirements of chapters 296-24, 296-62 and 296-155 WAC apply.

(6) The employer shall ensure that work assignments place no employee in a position or location not within ordinary calling distance of another employee able to render assistance in case of emergency.

**Note:** This subsection does not apply to operators of motor vehicles, watchpersons or other jobs which, by their nature, are single employee assignments. However, a definite procedure for checking the welfare of all employees during working hours should be instituted and all employees so advised.

(7) Each employer shall post and keep posted a notice or notices (Job Safety and Health Protection - Form F416-081-909) to be furnished by the department of labor and industries, informing employees of the protections and obligations provided for in the act and that for assistance and information, including copies of the act, and of specific safety and health standards employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to assure that such notices are not altered, defaced, or covered by other material.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-05-027, § 296-155-100, filed 2/7/06, effective 4/1/06. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-100, filed 1/18/95, effective 3/1/95; 94-15-096 (Order 94-07), § 296-155-100, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-100, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-100, filed 1/21/86; Order 76-6, § 296-155-100, filed 3/1/76; Order 74-26, § 296-155-100, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-105 Employee's responsibility.** (1) Employees shall coordinate and cooperate with all other employees in an attempt to eliminate accidents.

(2) Employees shall study and observe all safety standards governing their work.

(3) Employees shall apply the principles of accident prevention in their daily work and shall use proper safety devices and protective equipment as required by their employment or employer.

(4) Employees shall properly care for all personal protective equipment.

(5) Employees shall make a report, on the day of the incident, to their immediate supervisor, of each industrial injury or occupational illness, regardless of the degree of severity.

[Order 74-26, § 296-155-105, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-110 Accident prevention program. (1)**

Exemptions. Workers of employers whose primary business is other than construction, who are engaged solely in maintenance and repair work, including painting and decorating, are exempt from the requirement of this section provided:

(a) The maintenance and repair work, including painting and decorating, is being performed on the employer's premises, or facility.

(b) The length of the project does not exceed one week.

(c) The employer is in compliance with the requirements of WAC 296-800-140 Accident prevention program, and WAC 296-800-130, Safety committees and safety meetings.

(2) Each employer shall develop a formal accident-prevention program, tailored to the needs of the particular plant or operation and to the type of hazard involved. The department may be contacted for assistance in developing appropriate programs.

(3) The following are the minimal program elements for all employers:

A safety orientation program describing the employer's safety program and including:

(a) How, where, and when to report injuries, including instruction as to the location of first-aid facilities.

(b) How to report unsafe conditions and practices.

(c) The use and care of required personal protective equipment.

(d) The proper actions to take in event of emergencies including the routes of exiting from areas during emergencies.

(e) Identification of the hazardous gases, chemicals, or materials involved along with the instructions on the safe use and emergency action following accidental exposure.

(f) A description of the employer's total safety program.

(g) An on-the-job review of the practices necessary to perform the initial job assignments in a safe manner.

(4) Each accident-prevention program shall be outlined in written format.

(5) Every employer shall conduct crew leader-crew safety meetings as follows:

(a) Crew leader-crew safety meetings shall be held at the beginning of each job, and at least weekly thereafter.

(b) Crew leader-crew meetings shall be tailored to the particular operation.

(6) Crew leader-crew safety meetings shall address the following:

(a) A review of any walk-around safety inspection conducted since the last safety meeting.

(b) A review of any citation to assist in correction of hazards.

(c) An evaluation of any accident investigations conducted since the last meeting to determine if the cause of the unsafe acts or unsafe conditions involved were properly identified and corrected.

(d) Attendance shall be documented.

(e) Subjects discussed shall be documented.

Note: Subcontractors and their employees may, with the permission of the general contractor, elect to fulfill the requirements of subsection (5)(a) and (b) of this section by attending the prime contractors crew leader-crew safety meeting. Any of the requirements of subsections (6)(a), (b), (c), and (7) of this section not satisfied by the prime contractors safety meetings shall be the responsibility of the individual employers.

(7) Minutes of each crew leader-crew meeting shall be prepared and a copy shall be maintained at the location where the majority of the employees of each construction site report for work each day.

(8) Minutes of crew leader-crew safety meetings shall be retained by the employer for at least one year and shall be made available for review by personnel of the department, upon request.

(9) Every employer shall conduct walk-around safety inspections as follows:

(a) At the beginning of each job, and at least weekly thereafter, a walk-around safety inspection shall be conducted jointly by one member of management and one employee, elected by the employees, as their authorized representative.

(b) The employer shall document walk-around safety inspections and such documentation shall be available for inspection by personnel of the department.

(c) Records of walk-around inspections shall be maintained by the employer until the completion of the job.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-110, filed 5/9/01, effective 9/1/01; 00-08-078, § 296-155-110, filed 4/4/00, effective 7/1/00. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-110, filed 7/20/94, effective 9/20/94; 92-09-148 (Order 92-01), § 296-155-110, filed 4/22/92, effective 5/25/92. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-110, filed 1/21/86; Order 74-26, § 296-155-110, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-115 Safety bulletin board.** There shall be installed and maintained in every fixed establishment (the place where employees regularly report to work) employing eight or more persons, a safety bulletin board sufficient in size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material.

[Order 74-26, § 296-155-115, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-120 First-aid training and certification.** This section is designed to assure that all employees in this state are afforded quick and effective first-aid attention in the event of an on the job injury. To achieve this purpose the presence of personnel trained in first-aid procedures at or near those places where employees are working is required. Compliance with the provisions of this section may require the presence of more than one first-aid trained person.

(1) Each employer must have available at all worksites, where a crew is present, a person or persons holding a valid first-aid certificate.

(2) All crew leaders, supervisors or persons in direct charge of one or more employees must have a valid first-aid certificate.

(3) For the purposes of this section, a crew means a group of two or more employees working at any worksite.

Note: The requirement that all crew leaders, supervisors or person in direct charge of one or more employees (subsection (3)

of this section) applies even if other first-aid trained person(s) are available. In emergencies, crew leaders will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another crew leaders in the immediate work area has the necessary certificate.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-07-160, § 296-155-120, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-120, filed 5/9/01, effective 9/1/01; 00-01-038, § 296-155-120, filed 12/7/99, effective 2/1/00. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-120, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-120, filed 1/21/86; Order 74-26, § 296-155-120, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-125 First-aid supplies.** (1) The first-aid kits and supplies requirements of the safety and health core rules, chapter 296-800 WAC, apply within the scope of chapter 296-155 WAC.

(2) All vehicles used to transport work crews must be equipped with first-aid supplies.

(3) When practical, a poster must be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating the worksite address or location, and the phone numbers of emergency medical responders for the worksite.

(4) Requirements of WAC 296-800-15030, Make sure emergency washing facilities are functional and readily accessible, apply within the scope of chapter 296-155 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-05-027, § 296-155-125, filed 2/7/06, effective 4/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-125, filed 5/9/01, effective 9/1/01; 00-01-038, § 296-155-125, filed 12/7/99, effective 2/1/00. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-125, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-125, filed 1/21/86; Order 74-26, § 296-155-125, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-130 First-aid station.** Employers with fifty or more employees per shift at one location must establish a first-aid station in accordance with the requirements in chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-130, filed 5/9/01, effective 9/1/01; 00-01-038, § 296-155-130, filed 12/7/99, effective 2/1/00. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-130, filed 1/21/86; Order 74-26, § 296-155-130, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-140 Sanitation.** (1) Potable water.

(a) An adequate supply of potable water shall be provided in all places of employment.

(b) Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap. Water shall not be dipped from containers.

(c) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(d) The common drinking cup is prohibited.

(e) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(f) All water containers used to furnish drinking water shall be thoroughly cleaned at least once each week or more often as conditions require.

(g) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(h) The following definitions apply:

(i) Mobile crew: A work crew that routinely moves to a different work location periodically. Normally a mobile crew is not at the same location all day.

(ii) Normally unattended work location: An unattended site that is visited occasionally by one or more employees.

(iii) Nearby facility: A sanitary facility that is within three minutes travel by the transportation provided.

(iv) "Potable water" means water which meets the quality standards for drinking purposes of state or local authority having jurisdiction or water that meets the quality standards prescribed by the United States Environmental Protection Agency's National Interim Primary Drinking Water Regulations, published in 40 CFR Part 141, and 40 CFR 147.2400.

(2) Wash water.

(a) Clean, tepid wash water, between 70 and 100 degrees Fahrenheit, shall be provided at all construction sites.

(b) Individual hand towels shall be provided. Both a sanitary container for the unused towels and a receptacle for disposal of used towels shall be provided.

(c) Hand soap, industrial hand cleaner or similar cleansing agents shall be provided. Cleansing agents shall be adequate to remove any paints, coatings, herbicides, insecticides or other contaminants.

(d) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(e) Gasoline or solvents shall not be used for personal cleaning.

(f) Wash water areas will be maintained in a dry condition. Slipping or other hazards shall be eliminated from the wash water area before it is acceptable for use.

(3) Nonpotable water.

(a) Outlets for nonpotable water, such as water for industrial or fire fighting purposes only, shall be identified by signs meeting the requirements of Part E of this chapter, to indicate clearly that the water is unsafe and is not to be used for drinking, washing or cooking purposes.

(b) There shall be no cross-connection, open or potential, between a system furnishing potable water, a system furnishing nonpotable water or a system furnishing wash water.

(4) Toilets.

(a) The provisions of this section apply to both portable chemical toilets and to flush toilets, except where flush toilets are used the requirements of WAC 296-800-230 shall apply instead of (b) of this subsection.

(b) Accessible toilets shall be provided for employees according to the following table:

TABLE B-1

<u>Number of Employees</u>	<u>Toilets Required</u>
1 - 10	1
11 - 25	2
26 - 40	3
41 - 60	4
61 - 80	5
Over 80	one additional toilet for each additional twenty employees or any fraction thereof.

(c) When the employer provides both flush and portable chemical toilets, the number of employees allowed to be served by the flush toilets, per WAC 296-800-230 will be calculated. That number will be subtracted from the total number of employees and the employer will be required to provide an adequate number of portable chemical toilets for the number of remaining employees, as required by (b) of this subsection.

(d) Toilets shall be maintained in clean, sanitary and functional condition. Internal latches shall be provided to secure the units from inadvertent entry. Where there are twenty or more employees consisting of both sexes, facilities shall be provided for each sex.

(i) Each unit shall be properly cleaned on a routine basis.

(ii) Chemicals, toilet tissue and sanitary seat covers shall be maintained in a supply sufficient for use during the entire shift.

(iii) Any defective or inadequate unit shall be immediately removed from service.

(e) Specifications. The following specifications apply:

(i) A noncaustic chemical toilet (portable chemical toilet) is a self-contained unit equipped with a waste receiving chemical holding container.

(ii) Portable chemical toilets consisting of only a holding tank, commonly referred to as "elevator units" or "elevator toilets" are not acceptable. "Elevator units" may be used if they are individually located in a lockable room which affords privacy. When this type unit is used in a private individual lockable room the entire room will be considered a toilet facility, as such the room will meet all requirements of toilet facilities and be inspected in accordance with subsection (5)(b)(iii) of this section.

(iii) Rooms, buildings or shelters housing toilets shall be of sound construction, easy to clean, provide shelter and provide privacy. The toilet rooms shall be ventilated to the outside and adequately lighted. All openings into the toilet room shall be covered with 16-mesh screen.

(iv) Toilets shall be serviced on a regular schedule. Servicing shall include the use of a disinfectant for cleaning urinals and seats, removing waste from containers, recharging containers with an odor controlling chemical and installing an adequate supply of toilet tissue and seat covers.

(v) Service shall be performed in accordance with local codes by approved servicing organizations. Waste shall be disposed of or discharged in accordance with requirements of local health department regulations.

(vi) Waste containers shall be fabricated from impervious materials, e.g. plastic, steel, fiberglass or their equivalent.

Containers shall be water tight and capable of containing the chemical waste in a sanitary manner. The container shall be fitted to the building in a manner so as to prevent insects from entering from the exterior of the building. Containers shall be adequate in size to be used by the number of persons, according to the schedule for minimum requirements, without filling the container to more than half of its volume before regularly scheduled servicing.

(vii) Removal of waste shall be handled in a clean and sanitary manner by means of a vacuum hose and received by a leak-proof tank truck. All valves on the tank shall be leak-proof.

(viii) Provisions shall be made so service trucks have a clear approach and convenient access to the toilets to be serviced.

(ix) Disposal of waste from tank trucks shall be in accordance with local health department requirements. In the absence of provisions by local health departments, waste must be disposed of through municipal or district sanitary sewage systems. Municipal or area sanitary sewage districts shall provide sewage disposal locations and facilities which are adequate and convenient for duly authorized toilet service organizations.

(f) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(5)(a) On multiemployer worksites, the prime contractor shall ensure that the requirements of this section are met. Each employer is responsible for seeing that facilities for their own employees are provided.

(b) Each employer shall ensure, at the beginning of each shift, that the sanitation facilities required by this section are inspected. If any facility or unit fails to meet the following requirements, immediate corrective action shall be taken. Such action shall be documented and maintained at the site for at least 72 hours. Inspection shall establish:

(i) Potable water: Sufficient supply of water, sufficient supply of cups, container integrity, cleanliness of unit and area, capacity of trash receptacle (empty).

(ii) Wash water: Sufficient supply of clean water, proper temperature, sufficient supply of towels, sufficient supply of cleansing agents, container integrity, cleanliness of unit and area without the presence of physical hazards, capacity of trash receptacle (empty).

(iii) Toilets: Sufficient supply of toilet tissue and sanitary seat covers, capacity and condition of chemical agent, capacity and condition of holding tank, cleanliness of unit and area without the presence of physical hazards, physical and structural condition of unit, condition of lock, condition of toilet seat and tissue holder, absence of all foreign debris.

(c) The location of the facilities required by subsections (1), (2) and (4) of this section shall be as close as practical to the highest concentration of employees.

(i) On multistory structures they shall be furnished on every third floor.

(ii) At all sites they shall be located within 200 feet horizontally of all employees.

(iii) The requirements of subsection (5)(c)(i) and (ii) do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(6) Food handling. All employees' food service facilities and operations shall meet the applicable laws, ordinances and regulations of the jurisdictions in which they are located.

(7) Temporary sleeping quarters. When temporary sleeping quarters are provided, they shall be heated, ventilated and lighted.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-140, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-140, filed 7/20/94, effective 9/20/94; 89-11-035 (Order 89-03), § 296-155-140, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-140, filed 1/21/86; Order 74-26, § 296-155-140, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-145 Occupational noise exposure.** The occupational noise exposure requirements of chapter 296-817 WAC, Hearing loss prevention (noise), apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-155-145, filed 5/19/03, effective 8/1/03. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-01-022 (Order 84-24), § 296-155-145, filed 12/11/84; 83-15-017 (Order 83-19), § 296-155-145, filed 7/13/83, effective 9/12/83; Order 76-29, § 296-155-145, filed 9/30/76; Order 74-26, § 296-155-145, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-150 Ionizing radiation.** (1) In construction and related activities involving the use of sources of ionizing radiation, the pertinent provisions of the Nuclear Regulatory Commission's Standards for Protection Against Radiation, relating to protection against occupational radiation exposure, shall apply.

(2) Any activity which involves the use of radioactive material or X ray, whether or not under license from the Nuclear Regulatory Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee shall perform such work.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-150, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-150, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-155 Nonionizing radiation.** (1) Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment.

(2) Proof of qualification of the laser equipment operator shall be available and in possession of operator at all times.

(3) Employees, when working in areas in which a potentially hazardous exposure (see WAC 296-62-09005(4)) to direct or reflected laser radiation exists, shall be provided with antilaser eye protection devices specified in Part C of this chapter.

(4) Areas in which Class II and III lasers are used shall be posted with standard laser warning placards.

(5) Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required.

When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off.

(6) Only mechanical or electronic means shall be used as a detector for guiding the internal alignment of the laser.

(7) The laser beam shall not be directed at employees.

(8) When it is raining or snowing, or when there is dust or fog in the air, and it is impracticable to cease laser system operation, employees shall be kept out of range of the area of source and target during such weather conditions.

(9) Laser equipment shall bear a conspicuously displayed label to indicate hazard classification. This label shall be prepared in accordance with 21 CFR 1040.10.

(10) Only Class I, II, or III laser equipment shall be used. Class IV laser equipment shall not be used.

(11) Laser unit in operation shall be set up above the heads of the employees, when possible.

(12) Employees shall not be exposed to radiofrequency/microwave radiation in excess of the permissible exposure limits specified in WAC 296-62-09005.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-155, filed 1/21/86; 85-01-022 (Order 84-24), § 296-155-155, filed 12/11/84; Order 74-26, § 296-155-155, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-160 Gases, vapors, fumes, dusts, and mists.** (1) Exposure of employees to inhalation, ingestion, skin absorption, or contact with any material or substance at a concentration above those specified in the general occupational health standards, WAC 296-62-07515 shall be avoided.

(2) To achieve compliance with subsection (1) of this section, administrative or engineering controls must first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in WAC 296-62-07515. Any equipment and technical measures used for this purpose must first be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with WAC 296-155-220.

(3) Whenever internal combustion equipment exhausts in enclosed spaces, tests shall be made and recorded to ensure that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. See chapter 296-62 WAC, the general occupational health standards and chapter 296-841 WAC, identifying and controlling respiratory hazards.

(4) Whenever any employee is exposed to asbestos, the provisions of the general occupational health standards, chapter 296-62 WAC shall apply.

(5) Subsections (1) and (2) of this section do not apply to the exposure of employees to formaldehyde. Whenever any employee is exposed to formaldehyde, the requirements of chapter 296-856 WAC shall apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-155-160, filed 4/4/06, effective 9/1/06; 05-03-093, § 296-155-160, filed 1/18/05, effective 3/1/05. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-160, filed 7/20/94, effective 9/20/94; 88-14-108 (Order 88-11), § 296-155-160, filed 7/6/88; 87-24-051 (Order 87-24), § 296-155-160, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-160, filed

4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-160, filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-155-160, filed 11/30/83; Order 74-26, § 296-155-160, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-165 Lighting and illumination.** For lighting and illumination requirements, see WAC 296-800-210, Lighting.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-24-089, § 296-155-165, filed 12/1/04, effective 1/1/05. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-165, filed 1/21/86; Order 74-26, § 296-155-165, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-170 Ventilation.** (1) General. Whenever hazardous substances such as dusts, fumes, mists, vapors, or gases exist or are produced in the course of construction work, their concentrations shall not exceed the limits specified in WAC 296-155-160(1). When ventilation is used as an engineering control method, the system shall be installed and operated according to the requirements of this section.

(2) Local exhaust ventilation. Local exhaust ventilation when used as described in (1) shall be designed to prevent dispersion into the air of dusts, fumes, mists, vapors, and gases in concentrations causing harmful exposure. Such exhaust systems shall be so designed that dusts, fumes, mists, vapors, or gases are not drawn through the work area of employees.

(3) Design and operation. Exhaust fans, jets, ducts, hoods, separators, and all necessary appurtenances, including refuse receptacles, shall be so designed, constructed, maintained and operated as to ensure the required protection by maintaining a volume and velocity of exhaust air sufficient to gather dusts, fumes, vapors, or gases from said equipment or process, and to convey them to suitable points of safe disposal, thereby preventing their dispersion in harmful quantities into the atmosphere where employees work.

(4) Duration of operations.

(a) The exhaust system shall be in operation continually during all operations which it is designed to serve. If the employee remains in the contaminated zone, the system shall continue to operate after the cessation of said operations, the length of time to depend upon the individual circumstances and effectiveness of the general ventilation system.

(b) Since dust capable of causing disability is, according to the best medical opinion, of microscopic size, tending to remain for hours in suspension in still air, it is essential that the exhaust system be continued in operation for a time after the work process or equipment served by the same shall have ceased, in order to ensure the removal of the harmful elements to the required extent.

Note: For the same reason, employees wearing respiratory equipment should not remove same immediately until a clear atmosphere has been established.

(5) Disposal of exhaust materials. The air outlet from every dust separator, and the dusts, fumes, mists, vapors, or gases collected by an exhaust or ventilating system shall discharge to the outside atmosphere. Collecting systems which return air to work area may be used if concentrations which accumulate in the work area air do not result in harmful exposure to employees. Dust and refuse discharged from an

exhaust system shall be disposed of in such a manner that it will not result in harmful exposure to employees.

[Order 74-26, § 296-155-170, filed 5/7/74, effective 6/6/74.]

### WAC 296-155-173 Methylenedianiline.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-173, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17301 Scope and application.** (1) This section applies to all construction work as defined in WAC 296-155-005, in which there is exposure to MDA, including but not limited to the following:

(a) Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain MDA;

(b) Installation or the finishing of surfaces with products containing MDA;

(c) MDA spill/emergency cleanup at construction sites; and

(d) Transportation, disposal, storage, or containment of MDA or products containing MDA on the site or location at which construction activities are performed.

(2) Except as provided in subsection (7) of this section and WAC 296-155-17311(5), this standard does not apply to the processing, use, and handling of products containing MDA where initial monitoring indicates that the product is not capable of releasing MDA in excess of the action level under the expected conditions of processing, use, and handling which will cause the greatest possible release; and where no "dermal exposure to MDA" can occur.

(3) Except as provided in subsection (7) of this section, this standard does not apply to the processing, use, and handling of products containing MDA where objective data are reasonably relied upon which demonstrate the product is not capable of releasing MDA under the expected conditions of processing, use, and handling which will cause the greatest possible release; and where no "dermal exposure to MDA" can occur.

(4) Except as provided in subsection (7) of this section, this standard does not apply to the storage, transportation, distribution, or sale of MDA in intact containers sealed in such a manner as to contain the MDA dusts, vapors, or liquids, except for the provisions of WAC 296-62-054 and 296-155-17309.

(5) Except as provided in subsection (7) of this section, this standard does not apply to materials in any form which contain less than 0.1% MDA by weight or volume.

(6) Except as provided in subsection (7) of this section, this standard does not apply to "finished articles containing MDA."

(7) Where products containing MDA are exempted under subsections (2) and (6) of this section, the employer shall maintain records of the initial monitoring results or objective data supporting that exemption and the basis for the employer's reliance on the data, as provided in the record-keeping provision of WAC 296-155-17331.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17301, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17303 Definitions.** For the purpose of this standard, the following definitions shall apply:

(1) "Action level" means a concentration of airborne MDA of 5 ppb as an 8-hour time-weighted average.

(2) "Authorized person" means any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring and measuring procedures under WAC 296-155-17333, or any other person authorized by the act or regulations issued under the act.

(3) "Container" means any barrel, bottle, can, cylinder, drum, reaction vessel, storage tank, commercial packaging, or the like, but does not include piping systems.

(4) "Decontamination area" means an area outside of, but as near as practical to, the regulated area, consisting of an equipment storage area, wash area, and clean change area, which is used for the decontamination of workers, materials, and equipment contaminated with MDA.

(5) "Dermal exposure to MDA" occurs where employees are engaged in the handling, application, or use of mixtures or materials containing MDA, with any of the following nonairborne forms of MDA:

(a) Liquid, powdered, granular, or flaked mixtures containing MDA in concentrations greater than 0.1% by weight or volume; and

(b) Materials other than "finished articles" containing MDA in concentrations greater than 0.1% by weight or volume.

(6) "Director" means the director of the department of labor and industries.

(7) "Emergency" means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which results in an unexpected and potentially hazardous release of MDA.

(8) "Employee exposure" means exposure to MDA which would occur if the employee were not using respirators or protective work clothing and equipment.

(9) "Finished article containing MDA" is defined as a manufactured item:

(a) Which is formed to a specific shape or design during manufacture;

(b) Which has end use function(s) dependent in whole or part upon its shape or design during end use; and

(c) Where applicable, is an item which is fully cured by virtue of having been subjected to the conditions (temperature, time) necessary to complete the desired chemical reaction.

(10) "Historical monitoring data" means monitoring data for construction jobs that meet the following conditions:

(a) The data upon which judgments are based are scientifically sound and were collected using methods that are sufficiently accurate and precise;

(b) The processes and work practices that were in use when the historical monitoring data were obtained are essentially the same as those to be used during the job for which initial monitoring will not be performed;

(c) The characteristics of the MDA-containing material being handled when the historical monitoring data were obtained are the same as those on the job for which initial monitoring will not be performed;

(d) Environmental conditions prevailing when the historical monitoring data were obtained are the same as those on the job for which initial monitoring will not be performed; and

(e) Other data relevant to the operations, materials, processing, or employee exposures covered by the exception are substantially similar. The data must be scientifically sound, the characteristics of the MDA containing material must be similar, and the environmental conditions comparable.

(11) "4,4' methylenedianiline" or "MDA" means the chemical 4,4'-diaminodiphenylmethane, Chemical Abstract Service Registry Number 101-77-9, in the form of a vapor, liquid, or solid. The definition also includes the salts of MDA.

(12) "Regulated areas" means areas where airborne concentrations of MDA exceed or can reasonably be expected to exceed, the permissible exposure limits, or where "dermal exposure to MDA" can occur.

(13) "STEL" means short-term exposure limit as determined by any 15-minute sample period.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17303, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17305 Permissible exposure limits.**

The employer shall assure that no employee is exposed to an airborne concentration of MDA in excess of ten parts per billion (10 ppb) as an 8-hour time-weighted average and a STEL of one hundred parts per billion (100 ppb).

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17305, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17307 Communication among employers.**

On multiemployer worksites, an employer performing work involving the application of MDA or materials containing MDA for which establishment of one or more regulated areas is required shall inform other employers on the site of the nature of the employer's work with MDA and of the existence of, and requirements pertaining to, regulated areas.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17307, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17309 Emergency situations.** (1) Written plan.

(a) A written plan for emergency situations shall be developed for each construction operation where there is a possibility of an emergency. The plan shall include procedures where the employer identifies emergency escape routes for her or his employees at each construction site before the construction operation begins. Appropriate portions of the plan shall be implemented in the event of an emergency.

(b) The plan shall specifically provide that employees engaged in correcting emergency conditions shall be equipped with the appropriate personal protective equipment and clothing as required in WAC 296-155-17317 and 296-155-17319 until the emergency is abated.

(c) The plan shall specifically include provisions for alerting and evacuating affected employees as well as the applicable elements prescribed in WAC 296-24-567, "Employee emergency plans and fire prevention plans."

(2) Alerting employees. Where there is the possibility of employee exposure to MDA due to an emergency, means shall be developed to promptly alert employees who have the potential to be directly exposed. Affected employees not engaged in correcting emergency conditions shall be evacuated immediately in the event that an emergency occurs. Means shall also be developed for alerting other employees who may be exposed as a result of the emergency.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17309, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17311 Exposure monitoring.** (1) General.

(a) Determinations of employee exposure shall be made from breathing zone air samples that are representative of each employee's exposure to airborne MDA over an 8-hour period. Determination of employee exposure to the STEL shall be made from breathing zone air samples collected over a 15 minute sampling period.

(b) Representative employee exposure shall be determined on the basis of one or more samples representing full shift exposure for each shift for each job classification in each work area where exposure to MDA may occur.

(c) Where the employer can document that exposure levels are equivalent for similar operations in different work shifts, the employer shall only be required to determine representative employee exposure for that operation during one shift.

(2) Initial monitoring. Each employer who has a workplace or work operation covered by this standard shall perform initial monitoring to determine accurately the airborne concentrations of MDA to which employees may be exposed unless:

(a) The employer can demonstrate, on the basis of objective data, that the MDA-containing product or material being handled cannot cause exposures above the standard's action level, even under worst-case release conditions; or

(b) The employer has historical monitoring or other data demonstrating that exposures on a particular job will be below the action level.

(3) Periodic monitoring and monitoring frequency.

(a) If the monitoring required by subsection (2)(b) of this section reveals employee exposure at or above the action level, but at or below the PELs, the employer shall repeat such monitoring for each such employee at least every 6 months.

(b) If the monitoring required by subsection (2)(b) of this section reveals employee exposure above the PELs, the employer shall repeat such monitoring for each such employee at least every 3 months.

(c) Employers who are conducting MDA operations within a regulated area can forego periodic monitoring if the employees are all wearing supplied-air respirators while working in the regulated area.

(d) The employer may alter the monitoring schedule from every three months to every six months for any employee for whom two consecutive measurements taken at least 7 days apart indicate that the employee exposure has decreased to below the PELs but above the action level.

(4) Termination of monitoring.

(a) If the initial monitoring required by subsection (2)(b) of this section reveals employee exposure to be below the action level, the employer may discontinue the monitoring for that employee, except as otherwise required by subsection (5) of this section.

(b) If the periodic monitoring required by subsection (3) of this section reveals that employee exposures, as indicated by at least two consecutive measurements taken at least 7 days apart, are below the action level the employer may discontinue the monitoring for that employee, except as otherwise required by subsection (5) of this section.

(5) Additional monitoring. The employer shall institute the exposure monitoring required under subsections (2)(b) and (c) of this section when there has been a change in production process, chemicals present, control equipment, personnel, or work practices which may result in new or additional exposures to MDA, or when the employer has any reason to suspect a change which may result in new or additional exposures.

(6) Accuracy of monitoring. Monitoring shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of MDA.

(7) Employee notification of monitoring results.

(a) The employer shall, as soon as possible but no later than 5 working days after the receipt of the results of any monitoring performed under this standard, notify each employee of these results, in writing, either individually or by posting of results in an appropriate location that is accessible to affected employees.

(b) The written notification required by subdivision (a) of this subsection shall contain the corrective action being taken by the employer or any other protective measures which have been implemented to reduce the employee exposure to or below the PELs, wherever the PELs are exceeded.

(8) Visual monitoring. The employer shall make routine inspections of employee hands, face, and forearms potentially exposed to MDA. Other potential dermal exposures reported by the employee must be referred to the appropriate medical personnel for observation. If the employer determines that the employee has been exposed to MDA the employer shall:

(a) Determine the source of exposure;

(b) Implement protective measures to correct the hazard; and

(c) Maintain records of the corrective actions in accordance with WAC 296-155-17327.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-05-027, § 296-155-17311, filed 2/7/06, effective 4/1/06. Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17311, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17313 Regulated areas.** (1) Establishment.

(a) Airborne exposures. The employer shall establish regulated areas where airborne concentrations of MDA exceed, or can reasonably be expected to exceed, the permissible exposure limits.

(b) Dermal exposures. Where employees are subject to "dermal exposure to MDA" the employer shall establish those work areas as regulated areas.

(2) Demarcation. Regulated areas shall be demarcated from the rest of the workplace in a manner that minimizes the number of persons potentially exposed.

(3) Access. Access to regulated areas shall be limited to authorized persons.

(4) Personal protective equipment and clothing. Each person entering a regulated area shall be supplied with, and required to use, the appropriate personal protective clothing and equipment in accordance with WAC 296-155-17317 and 296-155-17319.

(5) Prohibited activities. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17313, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17315 Methods of compliance.** (1) Engineering controls and work practices and respirators.

(a) The employer shall use one or any combination of the following control methods to achieve compliance with the permissible exposure limits prescribed by WAC 296-155-17317.

(i) Local exhaust ventilation equipped with HEPA filter dust collection systems;

(ii) General ventilation systems;

(iii) Use of work practices; or

(iv) Other engineering controls such as isolation and enclosure that the director can show to be feasible.

(b) Wherever the feasible engineering controls and work practices which can be instituted are not sufficient to reduce employee exposure to or below the PELs, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protective devices which comply with the requirements of WAC 296-155-17317.

(2) Special provisions. For workers engaged in spray application methods, respiratory protection must be used in addition to feasible engineering controls and work practices to reduce employee exposure to or below the PELs.

(3) Prohibitions. Compressed air shall not be used to remove MDA unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

(4) Employee rotation. The employer shall not use employee rotation as a means of compliance with the exposure limits prescribed in WAC 296-155-17305.

(5) Compliance program.

(a) The employer shall establish and implement a written program to reduce employee exposure to or below the PELs by means of engineering and work practice controls, as required by subsection (1) of this section, and by use of respiratory protection where permitted under this section.

(b) Upon request this written program shall be furnished for examination and copying to the director, affected employees, and designated employee representatives. The employer shall review and, as necessary, update such plans at least once every 12 months to make certain they reflect the current status of the program.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17315, filed 2/3/93, effective 3/15/93.]

(2007 Ed.)

**WAC 296-155-17317 Respiratory protection.** (1) General. For employees who use respirators required by this section, the employer must provide respirators that comply with the requirements of this section. Respirators must be used during:

(a) Periods necessary to install or implement feasible engineering and work-practice controls.

(b) Work operations, such as maintenance and repair activities and spray application processes, for which engineering and work-practice controls are not feasible.

(c) Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposure to or below the PELs.

(d) Emergencies.

(2) Respirator program. The employer must implement a respiratory protection program as required by chapter 296-842 WAC, except WAC 296-842-13005 and 296-842-14005.

(3) Respirator selection.

(a) The employer must select the appropriate respirator from Table 1 of this section.

Table 1.—Respiratory Protection for MDA  
Airborne concentration of MDA or condition of use      Respirator type

a. Less than or equal to 10xPEL	(1) Half-mask respirator with HEPA <sup>1</sup> cartridge. <sup>2</sup>
b. Less than or equal to 50xPEL	(1) Full facepiece respirator with HEPA <sup>1</sup> cartridge or canister. <sup>2</sup>
c. Less than or equal to 1000xPEL	(1) Full facepiece powered air-purifying respirator with HEPA <sup>1</sup> cartridges. <sup>2</sup>
d. Greater than 1000xPEL or unknown	(1) Self-contained breathing concentration apparatus with full facepiece in positive pressure mode; (2) Full facepiece positive-pressure demand supplied-air respirator with auxiliary self-contained air supply.
e. Escape	(1) Any full facepiece air-purifying respirator with HEPA <sup>1</sup> cartridges; <sup>2</sup> (2) Any positive pressure or continuous flow self-contained breathing apparatus with full facepiece or hood.
f. Fire fighting	(1) Full facepiece self-contained breathing apparatus in positive pressure mode.

Note: Respirators assigned for higher environmental concentration may be used at lower concentrations.

<sup>1</sup>High efficiency particulate in air filter (HEPA) means a filter that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers or larger.

<sup>2</sup>Combination HEPA/organic vapor cartridges shall be used whenever MDA in liquid form or a process requiring heat is used.

(b) An employee who cannot use a negative-pressure respirator must be given the option of using a positive-pressure respirator, or a supplied-air respirator operated in the continuous-flow or pressure-demand mode.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-155-17317, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-10-071, § 296-155-17317, filed 5/4/99, effective 9/1/99. Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17317, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17319 Protective work clothing and equipment.** (1) Provision and use. Where employees are subject to dermal exposure to MDA, where liquids containing MDA can be splashed into the eyes, or where airborne concentrations of MDA are in excess of the PEL, the employer shall provide, at no cost to the employee, and ensure that the employee uses, appropriate protective work clothing and equipment which prevent contact with MDA such as, but not limited to:

- (a) Aprons, coveralls, or other full-body work clothing;
- (b) Gloves, head coverings, and foot coverings; and
- (c) Face shields, chemical goggles; or
- (d) Other appropriate protective equipment which comply with WAC 296-24-078.

(2) Removal and storage.

(a) The employer shall ensure that, at the end of their work shift, employees remove MDA-contaminated protective work clothing and equipment that is not routinely removed throughout the day in change areas provided in accordance with the provisions in WAC 296-155-17321.

(b) The employer shall ensure that, during their work shift, employees remove all other MDA-contaminated protective work clothing or equipment before leaving a regulated area.

(c) The employer shall ensure that no employee takes MDA-contaminated work clothing or equipment out of the decontamination areas, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

(d) MDA-contaminated work clothing or equipment shall be placed and stored and transported in sealed, impermeable bags, or other closed impermeable containers.

(e) Containers of MDA-contaminated protective work clothing or equipment which are to be taken out of decontamination areas or the workplace for cleaning, maintenance, or disposal, shall bear labels warning of the hazards of MDA.

(3) Cleaning and replacement.

(a) The employer shall provide the employee with clean protective clothing and equipment. The employer shall ensure that protective work clothing or equipment required by this section is cleaned, laundered, repaired, or replaced at intervals appropriate to maintain its effectiveness.

(b) The employer shall prohibit the removal of MDA from protective work clothing or equipment by blowing, shaking, or any methods which allow MDA to reenter the workplace.

(c) The employer shall ensure that laundering of MDA-contaminated clothing shall be done so as to prevent the release of MDA in the workplace.

(d) Any employer who gives MDA-contaminated clothing to another person for laundering shall inform such person of the requirement to prevent the release of MDA.

(e) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with MDA of the potentially harmful effects of exposure.

(4) Visual examination.

(a) The employer shall ensure that employees' work clothing is examined periodically for rips or tears that may occur during performance of work.

(b) When rips or tears are detected, the protective equipment or clothing shall be repaired and replaced immediately.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17319, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17321 Hygiene facilities and practices.** (1) General.

(a) The employer shall provide decontamination areas for employees required to work in regulated areas or required by WAC 296-155-17319 to wear protective clothing. Exception: In lieu of the decontamination area requirement specified in this subsection, the employer may permit employees engaged in small scale, short duration operations, to clean their protective clothing or dispose of the protective clothing before such employees leave the area where the work was performed.

(b) Change areas. The employer shall ensure that change areas are equipped with separate storage facilities for protective clothing and street clothing, in accordance with WAC 296-24-12011.

(c) Equipment area. The equipment area shall be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective clothing and equipment.

(2) Shower area.

(a) Where feasible, shower facilities shall be provided which comply with WAC 296-24-12010 wherever the possibility of employee exposure to airborne levels of MDA in excess of the permissible exposure limit exists.

(b) Where dermal exposure to MDA occurs, the employer shall ensure that materials spilled or deposited on the skin are removed as soon as possible by methods which do not facilitate the dermal absorption of MDA.

(3) Lunch areas.

(a) Whenever food or beverages are consumed at the worksite and employees are exposed to MDA the employer shall provide clean lunch areas where MDA levels are below the action level and where no dermal exposure to MDA can occur.

(b) The employer shall ensure that employees wash their hands and faces with soap and water prior to eating, drinking, smoking, or applying cosmetics.

(c) The employer shall ensure that employees do not enter lunch facilities with contaminated protective work clothing or equipment.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-17321, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17321, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17323 Communication of hazards to employees.** (1) Signs and labels.

(a) The employer shall post and maintain legible signs demarcating regulated areas and entrances or accessways to regulated areas that bear the following legend:

DANGER MDA MAY CAUSE CANCER LIVER TOXIN  
AUTHORIZED PERSONNEL ONLY  
RESPIRATORS AND PROTECTIVE CLOTHING  
MAY BE REQUIRED TO BE WORN IN THIS AREA

(b) The employer shall ensure that labels or other appropriate forms of warning are provided for containers of MDA within the workplace. The labels shall comply with the requirements of WAC 296-800-170 and shall include one of the following legends:

(i) For pure MDA

DANGER CONTAINS MDA MAY CAUSE CANCER LIVER TOXIN

(ii) For mixtures containing MDA

DANGER CONTAINS MDA CONTAINS MATERIALS  
WHICH MAY CAUSE CANCER LIVER TOXIN

(2) Material safety data sheets (MSDS). Employers shall obtain or develop, and shall provide access to their employees to, a material safety data sheet (MSDS) for MDA.

(3) Information and training.

(a) The employer shall provide employees with information and training on MDA, in accordance with WAC 296-800-170, at the time of initial assignment and at least annually thereafter.

(b) In addition to the information required under WAC 296-800-170, the employer shall:

(i) Provide an explanation of the contents of this section, including Appendices A and B of this section, and indicate to employees where a copy of the standard is available;

(ii) Describe the medical surveillance program required under WAC 296-155-17327, and explain the information contained in Appendix C of this standard; and

(iii) Describe the medical removal provision required under WAC 296-155-17327.

(4) Access to training materials.

(a) The employer shall make readily available to all affected employees, without cost, all written materials relating to the employee training program, including a copy of this regulation.

(b) The employer shall provide to the director, upon request, all information and training materials relating to the employee information and training program.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-17323, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17323, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17325 Housekeeping.** (1) All surfaces shall be maintained as free as practicable of visible accumulations of MDA.

(2) The employer shall institute a program for detecting MDA leaks, spills, and discharges, including regular visual inspections of operations involving liquid or solid MDA.

(3) All leaks shall be repaired and liquid or dust spills cleaned up promptly.

(4) Surfaces contaminated with MDA may not be cleaned by the use of compressed air.

(5) Shoveling, dry sweeping, and other methods of dry clean-up of MDA may be used where HEPA-filtered vacuuming and/or wet cleaning are not feasible or practical.

(6) Waste, scrap, debris, bags, containers, equipment, and clothing contaminated with MDA shall be collected and disposed of in a manner to prevent the reentry of MDA into the workplace.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17325, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17327 Medical surveillance.** (1) General.

(a) The employer shall make available a medical surveillance program for employees exposed to MDA under the following circumstances:

(i) Employees exposed at or above the action level for 30 or more days per year;

(ii) Employees who are subject to dermal exposure to MDA for 15 or more days per year;

(iii) Employees who have been exposed in an emergency situation;

(iv) Employees whom the employer, based on results from compliance with WAC 296-155-17311(8) has reason to believe are being dermally exposed; and

(v) Employees who show signs or symptoms of MDA exposure.

(b) The employer shall ensure that all medical examinations and procedures are performed by or under the supervision of a licensed physician at a reasonable time and place, and provided without cost to the employee.

(2) Initial examinations.

(a) Within 150 days of the effective date of this standard, or before the time of initial assignment, the employer shall provide each employee covered by subsection (1)(a) of this section with a medical examination including the following elements:

A detailed history which includes:

(i) Past work exposure to MDA or any other toxic substances;

(ii) A history of drugs, alcohol, tobacco, and medication routinely taken (duration and quantity); and

(iii) A history of dermatitis, chemical skin sensitization, or previous hepatic disease.

(iv) A physical examination which includes all routine physical examination parameters, skin examination, and examination for signs of liver disease.

(v) Laboratory tests including:

(A) Liver function tests; and

(B) Urinalysis.

(vi) Additional tests as necessary in the opinion of the physician.

(b) No initial medical examination is required if adequate records show that the employee has been examined in accordance with the requirements of this section within the previous six months prior to the effective date of this standard or prior to the date of initial assignment.

## (3) Periodic examinations.

(a) The employer shall provide each employee covered by this section with a medical examination at least annually following the initial examination. These periodic examinations shall include at least the following elements:

(i) A brief history regarding any new exposure to potential liver toxins, changes in drug, tobacco, and alcohol intake, and the appearance of physical signs relating to the liver and the skin;

(ii) The appropriate tests and examinations including liver function tests and skin examinations; and

(iii) Appropriate additional tests or examinations as deemed necessary by the physician.

(b) If in the physician's opinion the results of liver function tests indicate an abnormality, the employee shall be removed from further MDA exposure in accordance with WAC 296-155-17329. Repeat liver function tests shall be conducted on advice of the physician.

(4) Emergency examinations. If the employer determines that the employee has been exposed to a potentially hazardous amount of MDA in an emergency situation under WAC 296-155-17309, the employer shall provide medical examinations in accordance with subsection (3)(a) and (b). If the results of liver function testing indicate an abnormality, the employee shall be removed in accordance with WAC 296-155-17329. Repeat liver function tests shall be conducted on the advice of the physician. If the results of the tests are normal, tests must be repeated two to three weeks from the initial testing. If the results of the second set of tests are normal and on the advice of the physician, no additional testing is required.

(5) Additional examinations. Where the employee develops signs and symptoms associated with exposure to MDA, the employer shall provide the employee with an additional medical examination including liver function tests. Repeat liver function tests shall be conducted on the advice of the physician. If the results of the tests are normal, tests must be repeated two to three weeks from the initial testing. If the results of the second set of tests are normal and on the advice of the physician, no additional testing is required.

## (6) Multiple physician review mechanism.

(a) If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee under this section, and the employee has signs or symptoms of occupational exposure to MDA (which could include an abnormal liver function test), and the employee disagrees with the opinion of the examining physician, and this opinion could affect the employee's job status, the employee may designate an appropriate and mutually acceptable second physician:

(i) To review any findings, determinations, or recommendations of the initial physician; and

(ii) To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

(b) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the fol-

lowing within 15 days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

(i) The employee informing the employer that he or she intends to seek a second medical opinion; and

(ii) The employee initiating steps to make an appointment with a second physician.

(c) If the findings, determinations, or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

(d) If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

(i) To review any findings, determinations, or recommendations of the prior physicians; and

(ii) To conduct such examinations, consultations, laboratory tests, and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

(e) The employer shall act consistent with the findings, determinations, and recommendations of the second physician, unless the employer and the employee reach a mutually acceptable agreement.

(f) Information provided to the examining physician.

(i) The employer shall provide the following information to the examining physician:

(A) A copy of this regulation and its appendices;

(B) A description of the affected employee's duties as they relate to the employee's potential exposure to MDA;

(C) The employee's current actual or representative MDA exposure level;

(D) A description of any personal protective equipment used or to be used; and

(E) Information from previous employment related medical examinations of the affected employee.

(ii) The employer shall provide the foregoing information to a second physician under this section upon request either by the second physician, or by the employee.

(g) Physician's written opinion.

(i) For each examination under this section, the employer shall obtain, and provide the employee with a copy of, the examining physician's written opinion within 15 days of its receipt. The written opinion shall include the following:

(A) The occupationally pertinent results of the medical examination and tests;

(B) The physician's opinion concerning whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of health from exposure to MDA;

(C) The physician's recommended limitations upon the employee's exposure to MDA or upon the employee's use of protective clothing or equipment and respirators; and

(D) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions resulting from MDA exposure which require further explanation or treatment.

(ii) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposures.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17327, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17329 Medical removal.** (1) Temporary medical removal of an employee.

(a) Temporary removal resulting from occupational exposure. The employee shall be removed from work environments in which exposure to MDA is at or above the action level or where dermal exposure to MDA may occur, following an initial examination (WAC 296-155-17327(2)), periodic examinations (WAC 296-155-17327(3)), an emergency situation (WAC 296-155-17327(4)), or an additional examination (WAC 296-155-17327(5)) in the following circumstances:

(i) When the employee exhibits signs and/or symptoms indicative of acute exposure to MDA; or

(ii) When the examining physician determines that an employee's abnormal liver function tests are not associated with MDA exposure but that the abnormalities may be exacerbated as a result of occupational exposure to MDA.

(b) Temporary removal due to a final medical determination.

(i) The employer shall remove an employee from work having an exposure to MDA at or above the action level or where the potential for dermal exposure exists on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to MDA.

(ii) For the purposes of this section, the phrase "final medical determination" shall mean the outcome of the physician review mechanism used pursuant to the medical surveillance provisions of this section.

(iii) Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to MDA, the employer shall implement and act consistent with the recommendation.

(2) Return of the employee to former job status.

(a) The employer shall return an employee to her or his former job status:

(i) When the employee no longer shows signs or symptoms of exposure to MDA, or upon the advice of the physician.

(ii) When a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to MDA.

(b) For the purposes of this section, the requirement that an employer return an employee to his or her former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(3) Removal of other employee special protective measure or limitations. The employer shall remove any limita-

tions placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(4) Employer options pending a final medical determination. Where the physician review mechanism used pursuant to the medical surveillance provisions of this section has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

(a) Removal. The employer may remove the employee from exposure to MDA, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of the physician who has reviewed the employee's health status.

(b) Return. The employer may return the employee to her or his former job status, and end any special protective measures provided to the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions:

(i) If the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician; or

(ii) The employee has been on removal status for the preceding six months as a result of exposure to MDA, then the employer shall await a final medical determination.

(5) Medical removal protection benefits.

(a) Provisions of medical removal protection benefits. The employer shall provide to an employee up to six months of medical removal protection benefits on each occasion that an employee is removed from exposure to MDA or otherwise limited pursuant to this section.

(b) Definition of medical removal protection benefits. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer shall maintain the earnings, seniority, and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to MDA or otherwise limited.

(c) Follow-up medical surveillance during the period of employee removal or limitations. During the period of time that an employee is removed from normal exposure to MDA or otherwise limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this section.

(d) Workers' compensation claims. If a removed employee files a claim for workers' compensation payments for an MDA-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment-related expenses.

(e) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee

shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with any employer made possible by virtue of the employee's removal.

(f) Employees who do not recover within the 6 months of removal. The employer shall take the following measures with respect to any employee removed from exposure to MDA:

(i) The employer shall make available to the employee a medical examination pursuant to this section to obtain a final medical determination with respect to the employee;

(ii) The employer shall assure that the final medical determination obtained indicates whether or not the employee may be returned to her or his former job status, and, if not, what steps should be taken to protect the employee's health;

(iii) Where the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to her or his former job status, the employer shall continue to provide medical removal protection benefits to the employee until either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to her or his former job status; and

(iv) Where the employer acts pursuant to a final medical determination which permits the return of the employee to her or his former job status despite what would otherwise be an unacceptable liver function test, later questions concerning removing the employee again shall be decided by a final medical determination. The employer need not automatically remove such an employee pursuant to the MDA removal criteria provided by this section.

(6) Voluntary removal or restriction of an employee. When an employer, although not required by this section to do so, removes an employee from exposure to MDA or otherwise places limitations on an employee due to the effects of MDA exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by subsection (5) of this section.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17329, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17331 Recordkeeping.** (1) Objective data for exempted operations.

(a) Where the employer has relied on objective data that demonstrate that products made from or containing MDA are not capable of releasing MDA or do not present a dermal exposure problem under the expected conditions of processing, use, or handling to exempt such operations from the initial monitoring requirements under WAC 296-155-17311(2), the employer shall establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.

(b) The record shall include at least the following information:

(i) The product qualifying for exemption;

(ii) The source of the objective data;

(iii) The testing protocol, results of testing, and/or analysis of the material for the release of MDA;

(iv) A description of the operation exempted and how the data support the exemption; and

(v) Other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.

(c) The employer shall maintain this record for the duration of the employer's reliance upon such objective data.

(2) Historical monitoring data.

(a) Where the employer has relied on historical monitoring data that demonstrate that exposures on a particular job will be below the action level to exempt such operations from the initial monitoring requirements under WAC 296-155-17311(2), the employer shall establish and maintain an accurate record of historical monitoring data reasonably relied upon in support of the exception.

(b) The record shall include information that reflect the following conditions:

(i) The data upon which judgments are based are scientifically sound and were collected using methods that are sufficiently accurate and precise;

(ii) The processes and work practices that were in use when the historical monitoring data were obtained are essentially the same as those to be used during the job for which initial monitoring will not be performed;

(iii) The characteristics of the MDA-containing material being handled when the historical monitoring data were obtained are the same as those on the job for which initial monitoring will not be performed;

(iv) Environmental conditions prevailing when the historical monitoring data were obtained are the same as those on the job for which initial monitoring will not be performed; and

(v) Other data relevant to the operations, materials, processing, or employee exposures covered by the exception.

(c) The employer shall maintain this record for the duration of the employer's reliance upon such historical monitoring data.

(3) The employer may utilize the services of competent organizations such as industry trade associations and employee associations to maintain the records required by this section.

(4) Exposure measurements.

(a) The employer shall keep an accurate record of all measurements taken to monitor employee exposure to MDA.

(b) This record shall include at least the following information:

(i) The date of measurement;

(ii) The operation involving exposure to MDA;

(iii) Sampling and analytical methods used and evidence of their accuracy;

(iv) Number, duration, and results of samples taken;

(v) Type of protective devices worn, if any; and

(vi) Name, Social Security number, and exposure of the employees whose exposures are represented.

(c) The employer shall maintain this record for at least thirty years in accordance with chapter 296-62 WAC, Part B.

(5) Medical surveillance.

(a) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance by WAC 296-155-17327 in accordance with chapter 296-62 WAC, Part B.

(b) The record shall include at least the following information:

(i) The name and Social Security number of the employee;

(ii) A copy of the employee's medical examination results, including the medical history, questionnaire responses, results of any tests, and physician's recommendations;

(iii) Physician's written opinions;

(iv) Any employee medical complaints related to exposure to MDA; and

(v) A copy of the information provided to the physician as required by WAC 296-155-17327.

(c) The employer shall ensure that this record is maintained for the duration of employment plus thirty years in accordance with chapter 296-62 WAC, Part B.

(d) A copy of the employee's medical removal and return to work status.

(6) Training records. The employer shall maintain all employee training records for one year beyond the last date of employment.

(7) Availability.

(a) The employer, upon written request, shall make all records required to be maintained by this section available to the assistant secretary and the director for examination and copying.

(b) The employer, upon request, shall make any exposure records required by WAC 296-155-17311 and 296-155-17327 available for examination and copying to affected employees, former employees, designated representatives, and the director, in accordance with chapter 296-802 WAC.

(c) The employer, upon request, shall make employee medical records required by WAC 296-155-17327 and this section available for examination and copying to the subject employee, anyone having the specific written consent of the subject employee, and the director in accordance with chapter 296-802 WAC.

(8) Transfer of records.

(a) The employer shall comply with the requirements concerning transfer of records set forth in chapter 296-802 WAC.

(b) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the director at least 90 days prior to disposal and, upon request, transmit them to the director.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-155-17331, filed 4/27/04, effective 8/1/04. Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17331, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17333 Observation of monitoring.** (1) Employee observation. The employer shall provide affected employees, or their designated representatives, an opportunity to observe the measuring or monitoring of employee exposure to MDA conducted pursuant to WAC 296-155-17311.

(2) Observation procedures. When observation of the measuring or monitoring of employee exposure to MDA requires entry into areas where the use of protective clothing and equipment or respirators is required, the employer shall

provide the observer with personal protective clothing and equipment or respirators required to be worn by employees working in the area, assure the use of such clothing and equipment or respirators, and require the observer to comply with all other applicable safety and health procedures.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17333, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17337 Appendices.** The information contained in Appendices A, B, C, and D of this standard is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-10-071, § 296-155-17337, filed 5/4/99, effective 9/1/99. Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17337, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17339 Startup dates.** Compliance with all obligations of this standard commence March 3, 1993, except as follows:

(1) Initial monitoring under WAC 296-155-17311(2) shall be completed as soon as possible but no later than June 3, 1993.

(2) Medical examinations under WAC 296-155-17327, shall be completed as soon as possible but no later than August 14, 1993.

(3) Emergency plans required by WAC 296-155-17309 shall be provided and available for inspection and copying as soon as possible but no later than July 13, 1993.

(4) Initial training and education shall be completed as soon as possible but no later than July 13, 1993.

(5) Decontamination and lunch areas under WAC 296-155-17321 shall be in operation as soon as possible but no later than March 3, 1993.

(6) Respiratory protection required by WAC 296-155-17317 shall be provided as soon as possible but no later than July 13, 1993.

(7) Written compliance plans required by WAC 296-155-17315(5) shall be completed and available for inspection and copying as soon as possible but no later than July 13, 1993.

(8) WISHA shall enforce the permissible exposure limits in WAC 296-155-17305 no earlier than July 13, 1993.

(9) Engineering controls needed to achieve the PELs must be in place March 3, 1993.

(10) Personal protective clothing required by WAC 296-155-17317 shall be available July 13, 1993.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17339, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17341 Appendix A to WAC 296-155-173—Substance data sheet, for 4-4'-methylenedianiline.**

(1) Substance identification.

(a) Substance: Methylenedianiline (MDA).

(b) Permissible exposure:

(i) Airborne: Ten parts per billion parts of air (10 ppb), time-weighted average (TWA) for an 8-hour workday and an action level of five parts per billion parts of air (5 ppb).

(ii) Dermal: Eye contact and skin contact with MDA are not permitted.

(c) Appearance and odor: White to tan solid; amine odor.

(2) Health hazard data.

(a) Ways in which MDA affects your health. MDA can affect your health if you inhale it or if it comes in contact with your skin or eyes. MDA is also harmful if you happen to swallow it. Do not get MDA in eyes, on skin, or on clothing.

(b) Effects of overexposure.

(i) Short-term (acute) overexposure: Overexposure to MDA may produce fever, chills, loss of appetite, vomiting, jaundice. Contact may irritate skin, eyes, and mucous membranes. Sensitization may occur.

(ii) Long-term (chronic) exposure. Repeated or prolonged exposure to MDA, even at relatively low concentrations, may cause cancer. In addition, damage to the liver, kidneys, blood, and spleen may occur with long-term exposure.

(iii) Reporting signs and symptoms: You should inform your employer if you develop any signs or symptoms which you suspect are caused by exposure to MDA including yellow staining of the skin.

(3) Protective clothing and equipment.

(a) Respirators. Respirators are required for those operations in which engineering controls or work practice controls are not adequate or feasible to reduce exposure to the permissible limit. If respirators are worn, they must be certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR part 84, and cartridges or canisters must be replaced as necessary to maintain the effectiveness of the respirator. If you experience difficulty breathing while wearing a respirator, you may request a positive-pressure respirator from your employer. You must be thoroughly trained to use the assigned respirator, and the training will be provided by your employer. MDA does not have a detectable odor except at levels well above the permissible exposure limits. Do not depend on odor to warn you when a respirator canister is exhausted. If you can smell MDA while wearing a respirator, proceed immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

(b) Protective clothing. You may be required to wear coveralls, aprons, gloves, face shields, or other appropriate protective clothing to prevent skin contact with MDA. Where protective clothing is required, your employer is required to provide clean garments to you, as necessary, to assure that the clothing protects you adequately. Replace or repair impervious clothing that has developed leaks. MDA should never be allowed to remain on the skin. Clothing and shoes which are not impervious to MDA should not be allowed to become contaminated with MDA, and if they do, the clothing and shoes should be promptly removed and decontaminated. The clothing should be laundered to remove MDA or discarded. Once MDA penetrates shoes or other leather articles, they should not be worn again.

(c) Eye protection. You must wear splashproof safety goggles in areas where liquid MDA may contact your eyes. Contact lenses should not be worn in areas where eye contact with MDA can occur. In addition, you must wear a face shield if your face could be splashed with MDA liquid.

(4) Emergency and first-aid procedures.

(a) Eye and face exposure. If MDA is splashed into the eyes, wash the eyes for at least 15 minutes. See a doctor as soon as possible.

(b) Skin exposure. If MDA is spilled on your clothing or skin, remove the contaminated clothing and wash the exposed skin with large amounts of soap and water immediately. Wash contaminated clothing before you wear it again.

(c) Breathing. If you or any other person breathes in large amounts of MDA, get the exposed person to fresh air at once. Apply artificial respiration if breathing has stopped. Call for medical assistance or a doctor as soon as possible. Never enter any vessel or confined space where the MDA concentration might be high without proper safety equipment and at least one other person present who will stay outside. A life line should be used.

(d) Swallowing. If MDA has been swallowed and the patient is conscious, do not induce vomiting. Call for medical assistance or a doctor immediately.

(5) Medical requirements. If you are exposed to MDA at a concentration at or above the action level for more than 30 days per year, or exposed to liquid mixtures more than 15 days per year, your employer is required to provide a medical examination, including a medical history and laboratory tests, within 60 days of the effective date of this standard and annually thereafter. These tests shall be provided without cost to you. In addition, if you are accidentally exposed to MDA (either by ingestion, inhalation, or skin/eye contact) under conditions known or suspected to constitute toxic exposure to MDA, your employer is required to make special examinations and tests available to you.

(6) Observation of monitoring. Your employer is required to perform measurements that are representative of your exposure to MDA and you or your designated representative are entitled to observe the monitoring procedure. You are entitled to observe the steps taken in the measurement procedure and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn; you and your representative must also be provided with, and must wear, the protective clothing and equipment.

(7) Access to records. You or your representative are entitled to see the records of measurements of your exposure to MDA upon written request to your employer. Your medical examination records can be furnished to your physician or designated representative upon request by you to your employer.

(8) Precautions for safe use, handling, and storage.

(a) Material is combustible. Avoid strong acids and their anhydrides. Avoid strong oxidants. Consult supervisor for disposal requirements.

(b) Emergency clean-up. Wear self-contained breathing apparatus and fully clothe the body in the appropriate personal protective clothing and equipment.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-10-071, § 296-155-17341, filed 5/4/99, effective 9/1/99. Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17341, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17343 Appendix B to WAC 296-155-173—Substance technical guidelines, MDA.** (1) Identification.

- (a) Substance identification.
- (i) Synonyms: CAS No. 101-77-9. 4,4'-methylenedianiline; 4,4'-methylenebis(aniline); methylenedianiline; dianilino-methane.
- (ii) Formula:  $C_{13}H_{14}N_2$ .
- (b) Physical data.
- (2) Appearance and odor: White to tan solid; amine odor.
- (a) Molecular weight: 198.26.
- (b) Boiling point: 398-399 degrees C. at 760 mm Hg.
- (c) Melting point: 88-93 degrees C. (190-100 degrees F.).
- (d) Vapor pressure: 9 mm Hg at 232 degrees C.
- (e) Evaporation rate (n-butyl acetate=1): Negligible.
- (f) Vapor density (Air=1): Not applicable.
- (g) Volatile fraction by weight: Negligible.
- (h) Specific gravity (Water=1): Slight.
- (i) Heat of combustion: -8.40 kcal/g.
- (j) Solubility in water: Slightly soluble in cold water, very soluble in alcohol, benzene, ether, and many organic solvents.
- (3) Fire, explosion, and reactivity hazard data.
- (a) Flash point: 190 degrees C. (374 degrees F.) Set-  
aflash closed cup.
- (b) Flash point: 226 degrees C. (439 degrees F.) Cleve-  
land open cup.
- (c) Extinguishing media: Water spray; dry chemical;  
carbon dioxide.
- (d) Special fire fighting procedures: Wear self-con-  
tained breathing apparatus and protective clothing to prevent  
contact with skin and eyes.
- (e) Unusual fire and explosion hazards: Fire or exces-  
sive heat may cause production of hazardous decomposition  
products.
- (4) Reactivity data.
- (a) Stability: Stable.
- (b) Incompatibility: Strong oxidizers.
- (c) Hazardous decomposition products: As with any  
other organic material, combustion may produce carbon  
monoxide. Oxides of nitrogen may also be present.
- (d) Hazardous polymerization: Will not occur.
- (5) Spill and leak procedures.
- (a) Sweep material onto paper and place in fiber carton.
- (b) Package appropriately for safe feed to an incinerator  
or dissolve in compatible waste solvents prior to incineration.
- (c) Dispose of in an approved incinerator equipped with  
afterburner and scrubber or contract with licensed chemical  
waste disposal service.
- (d) Discharge treatment or disposal may be subject to  
federal, state, or local laws.
- (e) Wear appropriate personal protective equipment.
- (6) Special storage and handling precautions.
- (a) High exposure to MDA can occur when transferring  
the substance from one container to another. Such operations  
should be well ventilated and good work practices must be  
established to avoid spills.
- (b) Pure MDA is a solid with a low vapor pressure.  
Grinding or heating operations increase the potential for  
exposure.
- (c) Store away from oxidizing materials.

(d) Employers shall advise employees of all areas and operations where exposure to MDA could occur.

(7) Housekeeping and hygiene facilities.

(a) The workplace should be kept clean, orderly, and in a sanitary condition. The employer should institute a leak and spill detection program for operations involving MDA in order to detect sources of fugitive MDA emissions.

(b) Adequate washing facilities with hot and cold water are to be provided and maintained in a sanitary condition. Suitable cleansing agents should also be provided to assure the effective removal of MDA from the skin.

(8) Common operations. Common operations in which exposure to MDA is likely to occur include the following: Manufacture of MDA; manufacture of methylene diisocyanate; curing agent for epoxy resin structures; wire coating operations; and filament winding.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17343, filed 2/3/93, effective 3/15/93.]

### **WAC 296-155-17345 Appendix C to WAC 296-155-173—Medical surveillance guidelines for MDA.**

(1) Route of entry. Inhalation; skin absorption; ingestion. MDA can be inhaled, absorbed through the skin, or ingested.

(2) Toxicology. MDA is a suspect carcinogen in humans. There are several reports of liver disease in humans and animals resulting from acute exposure to MDA. A well documented case of an acute cardiomyopathy secondary to exposure to MDA is on record. Numerous human cases of hepatitis secondary to MDA are known. Upon direct contact MDA may also cause damage to the eyes. Dermatitis and skin sensitization have been observed. Almost all forms of acute environmental hepatic injury in humans involve the hepatic parenchyma and produce hepatocellular jaundice. This agent produces intrahepatic cholestasis. The clinical picture consists of cholestatic jaundice, preceded or accompanied by abdominal pain, fever, and chills. Onset in about 60% of all observed cases is abrupt with severe abdominal pain. In about 30% of observed cases, the illness presented and evolved more slowly and less dramatically, with only slight abdominal pain. In about 10% of the cases only jaundice was evident. The cholestatic nature of the jaundice is evident in the prominence of itching, the histologic predominance of bile stasis, and portal inflammatory infiltration, accompanied by only slight parenchymal injury in most cases, and by the moderately elevated transaminase values. Acute, high doses, however, have been known to cause hepatocellular damage resulting in elevated SGPT, SGOT, alkaline phosphatase, and bilirubin. Absorption through the skin is rapid. MDA is metabolized and excreted over a 48-hour period. Direct contact may be irritating to the skin, causing dermatitis. Also MDA which is deposited on the skin is not thoroughly removed through washing. MDA may cause bladder cancer in humans. Animal data supporting this assumption is not available nor is conclusive human data. However, human data collected on workers at a helicopter manufacturing facility where MDA is used suggests a higher incidence of bladder cancer among exposed workers.

(3) Signs and symptoms. Skin may become yellow from contact with MDA. Repeated or prolonged contact with MDA may result in recurring dermatitis (red-itchy, cracked skin) and eye irritation. Inhalation, ingestion, or absorption

through the skin at high concentrations may result in hepatitis, causing symptoms such as fever and chills, nausea and vomiting, dark urine, anorexia, rash, right upper quadrant pain, and jaundice. Corneal burns may occur when MDA is splashed in the eyes.

(4) Treatment of acute toxic effects/emergency situation. If MDA gets into the eyes, immediately wash eyes with large amounts of water. If MDA is splashed on the skin, immediately wash contaminated skin with mild soap or detergent. Employee should be removed from exposure and given proper medical treatment. Medical tests required under the emergency section of the medical surveillance (WAC 296-155-17327(4)) must be conducted. If the chemical is swallowed do not induce vomiting but remove by gastric lavage.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17345, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-17347 Appendix D to WAC 296-155-173—Sampling and analytical methods for MDA monitoring and measurement procedures.** Measurements taken for the purpose of determining employee exposure to MDA are best taken so that the representative average 8-hour exposure may be determined from a single 8-hour sample or two 4-hour samples. Short-time interval samples (or grab samples) may also be used to determine average exposure level if a minimum of five measurements are taken in a random manner over the 8-hour work shift. Random sampling means that any portion of the work shift has the same chance of being sampled as any other. The arithmetic average of all such random samples taken on one work shift is an estimate of an employee's average level of exposure for that work shift. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee). There are a number of methods available for monitoring employee exposures to MDA. The method OSHA currently uses is included below. The employer however has the obligation of selecting any monitoring method which meets the accuracy and precision requirements of the standard under her or his unique field conditions. The standard requires that the method of monitoring must have an accuracy, to a 95 percent confidence level, of not less than plus or minus 25 percent for the select PEL.

WISHA methodology.

Sampling procedure.

Apparatus:

Samples are collected by use of a personal sampling pump that can be calibrated within +/-5% of the recommended flow rate with the sampling filter in line. Samples are collected on 37 mm Gelman type A/E glass fiber filters treated with sulfuric acid. The filters are prepared by soaking each filter with 0.5 mL of 0.26N H<sub>2</sub>SO<sub>4</sub>. (0.26 N H<sub>2</sub>SO<sub>4</sub> can be prepared by diluting 1.5 mL of 36N H<sub>2</sub>SO<sub>4</sub> to 200 mL with deionized water.) The filters are dried in an oven at 100 degrees C. for one hour and then assembled into three-piece 37 mm polystyrene cassettes without backup pads. The front filter is separated from the back filter by a polystyrene spacer. The cassettes are sealed with shrink bands and the ends are plugged with plastic plugs. After sampling, the filters are carefully removed from the cassettes and individually transferred to

small vials containing approximately 2 mL deionized water. The vials must be tightly sealed. The water can be added before or after the filters are transferred. The vials must be sealable and capable of holding at least 7 mL of liquid. Small glass scintillation vials with caps containing Teflon liners are recommended.

Reagents:

Deionized water is needed for addition to the vials.

Sampling technique:

Immediately before sampling, remove the plastic plugs from the filter cassettes. Attach the cassette to the sampling pump with flexible tubing and place the cassette in the employee's breathing zone. After sampling, seal the cassettes with plastic plugs until the filters are transferred to the vials containing deionized water. At some convenient time within 10 hours of sampling, transfer the sample filters to vials. Seal the small vials lengthwise. Submit at least one blank filter with each sample set. Blanks should be handled in the same manner as samples, but no air is drawn through them. Record sample volumes (in L of air) for each sample, along with any potential interferences.

Retention efficiency:

A retention efficiency study was performed by drawing 100 L of air (80% relative humidity) at 1 L/min through sample filters that had been spiked with 0.814 micro-g MDA. Instead of using backup pads, blank acid-treated filters were used as backups in each cassette. Upon analysis, the top filters were found to have an average of 91.8% of the spiked amount. There was no MDA found on the bottom filters, so the amount lost was probably due to the slight instability of the MDA salt.

Extraction efficiency:

The average extraction efficiency for six filters spiked at the target concentration is 99.6%. The stability of extracted and derivatized samples was verified by reanalyzing the above six samples the next day using fresh standards. The average extraction efficiency for the reanalyzed samples is 98.7%. Recommended air volume and sampling rate. The recommended air volume is 100 L. The recommended sampling rate is 1 L/min.

Interferences (sampling):

MDI appears to be a positive interference. It was found that when MDI was spiked onto an acid-treated filter, the MDI converted to MDA after air was drawn through it. Suspected interferences should be reported to the laboratory with submitted samples.

Safety precautions (sampling):

Attach the sampling equipment to the employees so that it will not interfere with work performance or safety. Follow all safety procedures that apply to the work area being sampled.

Analytical procedure:

Apparatus:

The following are required for analysis. A GC equipped with an electron capture detector. For this evaluation a Hewlett Packard 5880 Gas Chromatograph equipped with a Nickel 63 High Temperature Electron Capture Detector and a Linearizer was used. A GC column capable of separating the MDA

derivative from the solvent and interferences. A 6 ft x 2 mm ID glass column packed with 3% OV-101 coated on 100/120 Gas Chrom Q or a 25 meter DB-1 or DB-5 capillary column is recommended for this evaluation. An electronic integrator or some other suitable means of measuring peak areas or heights. Small resealable vials with Teflon-lined caps capable of holding 4 mL. A dispenser or pipet for toluene capable of delivering 2.9 mL. Pipets (or repipets with plastic or Teflon tips) capable of delivering 1 mL for the sodium hydroxide and buffer solutions. A repipet capable of delivering 25 micro-L HFAA. Syringes for preparation of standards and injection of standards and samples into a GC. Volumetric flasks and pipets to dilute the pure MDA in preparation of standards. Disposable pipets to transfer the toluene layers after the samples are extracted.

#### Reagents:

0.5 NaOH prepared from reagent grade NaOH. Toluene, pesticide grade. Burdick and Jackson distilled in glass toluene was used. Heptafluorobutyric acid anhydride (HFAA). HFAA from Pierce Chemical Company was used. pH 7.0 phosphate buffer, prepared from 136 g potassium dihydrogen phosphate and 1 L deionized water. The pH is adjusted to 7.0 with saturated sodium hydroxide solution. 4,4'-methylenedianiline (MDA), reagent grade.

#### Standard preparation:

Concentrated stock standards are prepared by diluting pure MDA with toluene. Analytical standards are prepared by injecting micro-L amounts of diluted stock standards into vials that contain 2.0 mL toluene. 25 micro-L HFAA are added to each vial and the vials are capped and shaken for 10 seconds. After 10 min, 1 mL of buffer is added to each vial. The vials are recapped and shaken for 10 seconds. After allowing the layers to separate, aliquots of the toluene (upper) layers are removed with a syringe and analyzed by GC. Analytical standard concentrations should bracket sample concentrations. Thus, if samples fall out of the range of prepared standards, additional standards must be prepared to ascertain detector response.

#### Sample preparation:

The sample filters are received in vials containing deionized water. 1 mL of 0.5N NaOH and 2.0 mL toluene are added to each vial. The vials are recapped and shaken for 10 min. After allowing the layers to separate, approximately 1 mL aliquots of the toluene (upper) layers are transferred to separate vials with clean disposable pipets. The toluene layers are treated and analyzed.

#### Analysis:

##### GC conditions.

Zone temperatures: Column—220 degrees C. Injector—235 degrees C. Detector—335 degrees C. Gas flows, N<sub>2</sub> Column—30 mL/min He Purge—Column 0.9 mL/min. (capillary) with 30 mL/min. ArCH<sub>4</sub> (95/5) make up gas Injection volume: 5.0 uL Column: 6 ft x 1/8 in ID glass, 3% OV-101 on 100/120 Gas Chrom Q or 25 Retention time of MDA derivative: 2.5 to 3.5, depending on column and flow.

Chromatogram. Peak areas or heights are measured by an integrator or other suitable means. A calibration curve is constructed by plotting response (peak areas or heights) of stan-

dard injections versus micro-g of MDA per sample. Sample concentrations must be bracketed by standards.

#### Interferences (analytical):

Any compound that gives an electron capture detector response and has the same general retention time as the HFAA derivative of MDA is a potential interference. Suspected interferences reported to the laboratory with submitted samples by the industrial hygienist must be considered before samples are derivatized. GC parameters may be changed to possibly circumvent interferences. Retention time on a single column is not considered proof of chemical identity. Analyte identity should be confirmed by GC/MS if possible.

#### Calculations:

The analyte concentration for samples is obtained from the calibration curve in terms of micro-g MDA per sample. The extraction efficiency is 100%. If any MDA is found on the blank, that amount is subtracted from the sample amounts. The air concentrations are calculated using the following formulae.  $\text{micro-}\mu\text{g}/\text{m}^3 = (\text{micro-}\mu\text{g MDA per sample}) (1000)/(\text{L of air sampled})$   $\text{ppb} = (\text{micro-}\mu\text{g}/\text{m}^3) (24.46)/(198.3) = (\text{micro-}\mu\text{g}/\text{m}^3)(0.1233)$  where 24.46 is the molar volume at 25 degrees C. and 760 mm Hg.

Safety precautions (analytical). Avoid skin contact and inhalation of all chemicals. Restrict the use of all chemicals to a fume hood if possible. Wear safety glasses and a lab coat at all times while in the lab area.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17347, filed 2/3/93, effective 3/15/93.]

**WAC 296-155-174 Cadmium.** (1) Scope. This standard applies to all occupational exposures to cadmium and cadmium compounds, in all forms, in all construction work where an employee may potentially be exposed to cadmium. Construction work is defined as work involving construction, alteration, and/or repair, including but not limited to the following:

- (a) Wrecking, demolition, or salvage of structures where cadmium or materials containing cadmium are present;
- (b) Use of cadmium containing-paints and cutting, brazing, burning, grinding, or welding on surfaces that were painted with cadmium-containing paints;
- (c) Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain cadmium, or materials containing cadmium;
- (d) Cadmium welding; cutting and welding cadmium-plated steel; brazing or welding with cadmium alloys;
- (e) Installation of products containing cadmium;
- (f) Electrical grounding with cadmium-welding, or electrical work using cadmium-coated conduit;
- (g) Maintaining or retrofitting cadmium-coated equipment;
- (h) Cadmium contamination/emergency cleanup; and
- (i) Transportation, disposal, storage, or containment of cadmium or materials containing cadmium on the site or location at which construction activities are performed.

#### (2) Definitions.

- (a) Action level (AL) is defined as an airborne concentration of cadmium of 2.5 micrograms per cubic meter of air

(2.5 µg/m<sup>3</sup>), calculated as an 8-hour time-weighted average (TWA).

(b) Authorized person means any person authorized by the employer and required by work duties to be present in regulated areas or any person authorized by WISHA or regulations issued under it to be in regulated areas.

(c) Competent person, in accordance with WAC 296-155-012(4), means a person designated by the employer to act on the employer's behalf who is capable of identifying existing and potential cadmium hazards in the workplace and the proper methods to control them in order to protect workers, and has the authority necessary to take prompt corrective measures to eliminate or control such hazards. The duties of a competent person include at least the following: Determining prior to the performance of work whether cadmium is present in the workplace; establishing, where necessary, regulated areas and assuring that access to and from those areas is limited to authorized employees; assuring the adequacy of any employee exposure monitoring required by this standard; assuring that all employees exposed to air cadmium levels above the PEL wear appropriate personal protective equipment and are trained in the use of appropriate methods of exposure control; assuring that proper hygiene facilities are provided and that workers are trained to use those facilities; and assuring that the engineering controls required by this standard are implemented, maintained in proper operating condition, and functioning properly.

(d) Director means the director of the department of labor and industries or authorized representative.

(e) Employee exposure and similar language referring to the air cadmium level to which an employee is exposed means the exposure to airborne cadmium that would occur if the employee were not using respiratory protective equipment.

(f) Final medical determination is the written medical opinion of the employee's health status by the examining physician under subsection (12)(c) through (l) of this section or, if multiple physician review under subsection (12)(m) of this section or the alternative physician determination under subsection (12)(n) of this section is invoked, it is the final, written medical finding, recommendation or determination that emerges from that process.

(g) High-efficiency particulate air (HEPA) filter means a filter capable of trapping and retaining at least 99.97 percent of mono-dispersed particles of 0.3 micrometers in diameter.

(h) Regulated area means an area demarcated by the employer where an employee's exposure to airborne concentrations of cadmium exceeds, or can reasonably be expected to exceed the permissible exposure limit (PEL).

(i) This section means this cadmium standard.

(3) Permissible exposure limit (PEL). The employer shall assure that no employee is exposed to an airborne concentration of cadmium in excess of five micrograms per cubic meter of air (5 µg/m<sup>3</sup>), calculated as an 8-hour time-weighted average exposure (TWA).

(4) Exposure monitoring

(a) General.

(i) Prior to the performance of any construction work where employees may be potentially exposed to cadmium, the employer shall establish the applicability of this standard

by determining whether cadmium is present in the workplace and whether there is the possibility that employee exposures will be at or above the action level. The employer shall designate a competent person who shall make this determination. Investigation and material testing techniques shall be used, as appropriate, in the determination. Investigation shall include a review of relevant plans, past reports, material safety data sheets, and other available records, and consultations with the property owner and discussions with appropriate individuals and agencies.

(ii) Where cadmium has been determined to be present in the workplace, and it has been determined that there is a possibility the employee's exposure will be at or above the action level, the competent person shall identify employees potentially exposed to cadmium at or above the action level.

(iii) Determinations of employee exposure shall be made from breathing-zone air samples that reflect the monitored employee's regular, daily 8-hour TWA exposure to cadmium.

(iv) Eight-hour TWA exposures shall be determined for each employee on the basis of one or more personal breathing-zone air samples reflecting full shift exposure on each shift, for each job classification, in each work area. Where several employees perform the same job tasks, in the same job classification, on the same shift, in the same work area, and the length, duration, and level of cadmium exposures are similar, an employer may sample a representative fraction of the employees instead of all employees in order to meet this requirement. In representative sampling, the employer shall sample the employee(s) expected to have the highest cadmium exposures.

(b) Specific.

(i) Initial monitoring. Except as provided for in (b)(iii) of this subsection, where a determination conducted under (a)(i) of this subsection shows the possibility of employee exposure to cadmium at or above the action level, the employer shall conduct exposure monitoring as soon as practicable that is representative of the exposure for each employee in the workplace who is or may be exposed to cadmium at or above the action level.

(ii) In addition, if the employee periodically performs tasks that may expose the employee to a higher concentration of airborne cadmium, the employee shall be monitored while performing those tasks.

(iii) Where the employer has objective data, as defined in subsection (14)(b) of this section, demonstrating that employee exposure to cadmium will not exceed airborne concentrations at or above the action level under the expected conditions of processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

(iv) Where a determination conducted under (a) or (b) of this subsection is made that a potentially exposed employee is not exposed to airborne concentrations of cadmium at or above the action level, the employer shall make a written record of such determination. The record shall include at least the monitoring data developed under (b)(i) through (iii) of this subsection, where applicable, and shall also include the date of determination, and the name and Social Security number of each employee.

(c) Monitoring frequency (periodic monitoring).

(i) If the initial monitoring or periodic monitoring reveals employee exposures to be at or above the action level, the employer shall monitor at a frequency and pattern needed to assure that the monitoring results reflect with reasonable accuracy the employee's typical exposure levels, given the variability in the tasks performed, work practices, and environmental conditions on the job site, and to assure the adequacy of respiratory selection and the effectiveness of engineering and work practice controls.

(ii) If the initial monitoring or the periodic monitoring indicates that employee exposures are below the action level and that result is confirmed by the results of another monitoring taken at least seven days later, the employer may discontinue the monitoring for those employees whose exposures are represented by such monitoring.

(d) Additional monitoring. The employer also shall institute the exposure monitoring required under (b)(i) and (c) of this subsection whenever there has been a change in the raw materials, equipment, personnel, work practices, or finished products that may result in additional employees being exposed to cadmium at or above the action level or in employees already exposed to cadmium at or above the action level being exposed above the PEL, or whenever the employer or competent person has any reason to suspect that any other change might result in such further exposure.

(e) Employee notification of monitoring results.

(i) No later than five working days after the receipt of the results of any monitoring performed under this section, the employer shall notify each affected employee individually in writing of the results. In addition, within the same time period, the employer shall post the results of the exposure monitoring in an appropriate location that is accessible to all affected employees.

(ii) Wherever monitoring results indicate that employee exposure exceeds the PEL, the employer shall include in the written notice a statement that the PEL has been exceeded and a description of the corrective action being taken by the employer to reduce employee exposure to or below the PEL.

(f) Accuracy of measurement. The employer shall use a method of monitoring and analysis that has an accuracy of not less than plus or minus 25 percent ( $\pm 25\%$ ), with a confidence level of 95 percent, for airborne concentrations of cadmium at or above the action level and the permissible exposure limit.

(5) Regulated areas.

(a) Establishment. The employer shall establish a regulated area wherever an employee's exposure to airborne concentrations of cadmium is, or can reasonably be expected to be in excess of the permissible exposure limit (PEL).

(b) Demarcation. Regulated areas shall be demarcated from the rest of the workplace in any manner that adequately establishes and alerts employees of the boundaries of the regulated area, including employees who are or may be incidentally in the regulated areas, and that protects persons outside the area from exposure to airborne concentrations of cadmium in excess of the PEL.

(c) Access. Access to regulated areas shall be limited to authorized persons.

(d) Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respi-

lator, selected in accordance with subsection (7)(b) of this section.

(e) Prohibited activities. The employer shall assure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas, or carry the products associated with any of these activities into regulated areas or store such products in those areas.

(6) Methods of compliance.

(a) Compliance hierarchy.

(i) Except as specified in (a)(ii) of this subsection, the employer shall implement engineering and work practice controls to reduce and maintain employee exposure to cadmium at or below the PEL, except to the extent that the employer can demonstrate that such controls are not feasible.

(ii) The requirement to implement engineering controls to achieve the PEL does not apply where the employer demonstrates the following:

(A) The employee is only intermittently exposed; and

(B) The employee is not exposed above the PEL on 30 or more days per year (12 consecutive months).

(iii) Wherever engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, the employer nonetheless shall implement such controls to reduce exposures to the lowest levels achievable. The employer shall supplement such controls with respiratory protection that complies with the requirements of subsection (7) of this section and the PEL.

(iv) The employer shall not use employee rotation as a method of compliance.

(b) Specific operations.

(i) Abrasive blasting. Abrasive blasting on cadmium or cadmium-containing materials shall be conducted in a manner that will provide adequate protection.

(ii) Heating cadmium and cadmium-containing materials. Welding, cutting, and other forms of heating of cadmium or cadmium-containing materials shall be conducted in accordance with the requirements of WAC 296-155-415 and 296-155-420, where applicable.

(c) Prohibitions.

(i) High speed abrasive disc saws and similar abrasive power equipment shall not be used for work on cadmium or cadmium-containing materials unless they are equipped with appropriate engineering controls to minimize emissions, if the exposure levels are above the PEL.

(ii) Materials containing cadmium shall not be applied by spray methods, if exposures are above the PEL, unless employees are protected with supplied-air respirators with full facepiece, hood, helmet, suit, operated in positive pressure mode and measures are instituted to limit overspray and prevent contamination of adjacent areas.

(d) Mechanical ventilation.

(i) When ventilation is used to control exposure, measurements that demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made as necessary to maintain its effectiveness.

(ii) Measurements of the system's effectiveness in controlling exposure shall be made as necessary within five working days of any change in production, process, or control that might result in a significant increase in employee exposure to cadmium.

(iii) Recirculation of air. If air from exhaust ventilation is recirculated into the workplace, the system shall have a high efficiency filter and be monitored to assure effectiveness.

(iv) Procedures shall be developed and implemented to minimize employee exposure to cadmium when maintenance of ventilation systems and changing of filters is being conducted.

(e) Compliance program.

(i) Where employee exposure to cadmium exceeds the PEL and the employer is required under (a) of this subsection to implement controls to comply with the PEL, prior to the commencement of the job the employer shall establish and implement a written compliance program to reduce employee exposure to or below the PEL. To the extent that engineering and work practice controls cannot reduce exposures to or below the PEL, the employer shall include in the written compliance program the use of appropriate respiratory protection to achieve compliance with the PEL.

(ii) Written compliance programs shall be reviewed and updated as often and as promptly as necessary to reflect significant changes in the employer's compliance status or significant changes in the lowest air cadmium level that is technologically feasible.

(iii) A competent person shall review the comprehensive compliance program initially and after each change.

(iv) Written compliance programs shall be provided upon request for examination and copying to the director, or authorized representatives, affected employees, and designated employee representatives.

(7) Respirator protection.

(a) General. For employees who use respirators required by this section, the employer must provide respirators that comply with the requirements of this section. Respirators must be used during:

(i) Periods necessary to install or implement feasible engineering and work-practice controls when employee exposures exceed the PEL.

(ii) Maintenance and repair activities, and brief or intermittent operations, for which employee exposures exceed the PEL and engineering and work-practice controls are not feasible or are not required.

(iii) Work operations in regulated areas specified in subsection (5) of this section.

(iv) Work operations for which the employer has implemented all feasible engineering and work-practice controls, and such controls are not sufficient to reduce exposures to or below the PEL.

(v) Emergencies.

(vi) Work operations for which an employee, who is exposed to cadmium at or above the action level, requests a respirator.

(vii) Work operations for which engineering controls are not required under (a)(ii) of this subsection to reduce employee exposures that exceed the PEL.

(b) Respirator program.

(i) The employer must implement a respiratory protection program as required by chapter 296-842 WAC, except WAC 296-842-13005 and 296-842-14005.

(ii) If an employee has breathing difficulty during fit testing or respirator use, the employer must provide the employee with a medical examination as required by subsec-

tion (12)(f)(ii) of this section to determine if the employee can use a respirator while performing the required duties.

(iii) No employees must use a respirator when, based on their recent medical examination, the examining physician determines that the employee will be unable to continue to function normally while using a respirator. If the physician determines the employee must be limited in, or removed from, their current job because of the employee's inability to use a respirator, the job limitation or removal must be conducted as required by (k) and (l) of this subsection.

(c) Respirator selection.

(i) The employer must select the appropriate respirator from Table 1 of this section.

Airborne concentration or condition of use <sup>a</sup>	Required respirator type <sup>b</sup>
10 x or less	A half-mask, air-purifying respirator equipped with a HEPA <sup>c</sup> filter. <sup>d</sup>
25 x or less	A powered air-purifying respirator ("PAPR") with a loose-fitting hood or helmet equipped with a HEPA filter, or a supplied-air respirator with a loose-fitting hood or helmet facepiece operated in the continuous flow mode.
50 x or less	A full facepiece air-purifying respirator equipped with a HEPA filter, or a powered air-purifying respirator with a tight-fitting half-mask equipped with a HEPA filter, or a supplied air respirator with a tight-fitting half-mask operated in the continuous flow mode.
250 x or less	A powered air-purifying respirator with a tight-fitting full facepiece equipped with a HEPA filter, or a supplied-air respirator with a tight-fitting full facepiece operated in the continuous flow mode.
1000 x or less	A supplied-air respirator with half-mask or full facepiece operated in the pressure demand or other positive pressure mode.
>1000 x or unknown concentrations	A self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode, or a supplied-air respirator with a full facepiece operated in the pressure demand or other positive pressure mode and equipped with an auxiliary escape type self-contained breathing apparatus operated in the pressure demand mode.

Table 1

Respiratory Protection for Cadmium

Airborne concentration or condition of use <sup>a</sup>	Required respirator type <sup>b</sup>
Fire fighting	A self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Note: <sup>a</sup> Concentrations expressed as multiple of the PEL.  
<sup>b</sup> Respirators assigned for higher environmental concentrations may be used at lower exposure levels. Quantitative fit testing is required for all tight-fitting air purifying respirators where airborne concentration of cadmium exceeds 10 times the TWA PEL ( $10 \times 5 \mu\text{g}/\text{m}^3 = 50 \mu\text{g}/\text{m}^3$ ). A full facepiece respirator is required when eye irritation is experienced.  
<sup>c</sup> HEPA means High Efficiency Particulate Air.  
<sup>d</sup> Fit testing, qualitative or quantitative, is required.  
 Source: Respiratory Decision Logic, NIOSH, 1987.

(ii) The employer shall provide a powered, air-purifying respirator (PAPR) instead of a negative-pressure respirator when an employee entitled to a respirator chooses to use this type of respirator and such a respirator will provide adequate protection to the employee.

(8) Emergency situations. The employer shall develop and implement a written plan for dealing with emergency situations involving substantial releases of airborne cadmium. The plan shall include provisions for the use of appropriate respirators and personal protective equipment. In addition, employees not essential to correcting the emergency situation shall be restricted from the area and normal operations halted in that area until the emergency is abated.

(9) Protective work clothing and equipment

(a) Provision and use. If an employee is exposed to airborne cadmium above the PEL or where skin or eye irritation is associated with cadmium exposure at any level, the employer shall provide at no cost to the employee, and assure that the employee uses, appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments. Protective work clothing and equipment includes, but is not limited to:

- (i) Coveralls or similar full-body work clothing;
  - (ii) Gloves, head coverings, and boots or foot coverings;
- and

(iii) Face shields, vented goggles, or other appropriate protective equipment that complies with WAC 296-155-215.

(b) Removal and storage.

(i) The employer shall assure that employees remove all protective clothing and equipment contaminated with cadmium at the completion of the work shift and do so only in change rooms provided in accordance with subsection (10)(a) of this section.

(ii) The employer shall assure that no employee takes cadmium-contaminated protective clothing or equipment from the workplace, except for employees authorized to do so for purposes of laundering, cleaning, maintaining, or disposing of cadmium-contaminated protective clothing and equipment at an appropriate location or facility away from the workplace.

(iii) The employer shall assure that contaminated protective clothing and equipment, when removed for laundering, cleaning, maintenance, or disposal, is placed and stored in sealed, impermeable bags or other closed, impermeable con-

tainers that are designed to prevent dispersion of cadmium dust.

(iv) The employer shall assure that containers of contaminated protective clothing and equipment that are to be taken out of the change rooms or the workplace for laundering, cleaning, maintenance or disposal shall bear labels in accordance with subsection (13)(c) of this section.

(c) Cleaning, replacement, and disposal.

(i) The employer shall provide the protective clothing and equipment required by (a) of this subsection in a clean and dry condition as often as necessary to maintain its effectiveness, but in any event at least weekly. The employer is responsible for cleaning and laundering the protective clothing and equipment required by this subsection to maintain its effectiveness and is also responsible for disposing of such clothing and equipment.

(ii) The employer also is responsible for repairing or replacing required protective clothing and equipment as needed to maintain its effectiveness. When rips or tears are detected while an employee is working they shall be immediately mended, or the worksuit shall be immediately replaced.

(iii) The employer shall prohibit the removal of cadmium from protective clothing and equipment by blowing, shaking, or any other means that disperses cadmium into the air.

(iv) The employer shall assure that any laundering of contaminated clothing or cleaning of contaminated equipment in the workplace is done in a manner that prevents the release of airborne cadmium in excess of the permissible exposure limit prescribed in subsection (3) of this section.

(v) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with cadmium of the potentially harmful effects of exposure to cadmium, and that the clothing and equipment should be laundered or cleaned in a manner to effectively prevent the release of airborne cadmium in excess of the PEL.

(10) Hygiene areas and practices.

(a) General. For employees whose airborne exposure to cadmium is above the PEL, the employer shall provide clean change rooms, handwashing facilities, showers, and lunchroom facilities that comply with WAC 296-155-140.

(b) Change rooms. The employer shall assure that change rooms are equipped with separate storage facilities for street clothes and for protective clothing and equipment, which are designed to prevent dispersion of cadmium and contamination of the employee's street clothes.

(c) Showers and handwashing facilities.

(i) The employer shall assure that employees whose airborne exposure to cadmium is above the PEL shower during the end of the work shift.

(ii) The employer shall assure that employees who are exposed to cadmium above the PEL wash their hands and faces prior to eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics.

(d) Lunchroom facilities.

(i) The employer shall assure that the lunchroom facilities are readily accessible to employees, that tables for eating are maintained free of cadmium, and that no employee in a lunchroom facility is exposed at any time to cadmium at or above a concentration of  $2.5 \mu\text{g}/\text{m}^3$ .

(ii) The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or

equipment unless surface cadmium has been removed from the clothing and equipment by HEPA vacuuming or some other method that removes cadmium dust without dispersing it.

(11) Housekeeping.

(a) All surfaces shall be maintained as free as practicable of accumulations of cadmium.

(b) All spills and sudden releases of material containing cadmium shall be cleaned up as soon as possible.

(c) Surfaces contaminated with cadmium shall, wherever possible, be cleaned by vacuuming or other methods that minimize the likelihood of cadmium becoming airborne.

(d) HEPA-filtered vacuuming equipment or equally effective filtration methods shall be used for vacuuming. The equipment shall be used and emptied in a manner that minimizes the reentry of cadmium into the workplace.

(e) Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other methods that minimize the likelihood of cadmium becoming airborne have been tried and found not to be effective.

(f) Compressed air shall not be used to remove cadmium from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the dust cloud created by the compressed air.

(g) Waste, scrap, debris, bags, containers, personal protective equipment, and clothing contaminated with cadmium and consigned for disposal shall be collected and disposed of in sealed impermeable bags or other closed, impermeable containers. These bags and containers shall be labeled in accordance with subsection (13)(b) of this section.

(12) Medical surveillance.

(a) General.

(i) Scope.

(A) Currently exposed—The employer shall institute a medical surveillance program for all employees who are or may be exposed at or above the action level and all employees who perform the following tasks, operations, or jobs: Electrical grounding with cadmium-welding; cutting, brazing, burning, grinding, or welding on surfaces that were painted with cadmium-containing paints; electrical work using cadmium-coated conduit; use of cadmium containing paints; cutting and welding cadmium-plated steel; brazing or welding with cadmium alloys; fusing of reinforced steel by cadmium welding; maintaining or retrofitting cadmium-coated equipment; and, wrecking and demolition where cadmium is present. A medical surveillance program will not be required if the employer demonstrates that the employee:

(I) Is not currently exposed by the employer to airborne concentrations of cadmium at or above the action level on 30 or more days per year (twelve consecutive months); and

(II) Is not currently exposed by the employer in those tasks on 30 or more days per year (twelve consecutive months).

(B) Previously exposed—The employer shall also institute a medical surveillance program for all employees who might previously have been exposed to cadmium by the employer prior to the effective date of this section in tasks specified under (a)(i)(A) of this subsection, unless the employer demonstrates that the employee did not in the years prior to the effective date of this section work in those tasks

for the employer with exposure to cadmium for an aggregated total of more than 12 months.

(ii) To determine an employee's fitness for using a respirator, the employer shall provide the limited medical examination specified in (f) of this subsection.

(iii) The employer shall assure that all medical examinations and procedures required by this section are performed by or under the supervision of a licensed physician, who has read and is familiar with the health effects WAC 296-62-07441, Appendix A, the regulatory text of this section, the protocol for sample handling and lab selection in WAC 296-62-07451, Appendix F, and the questionnaire of WAC 296-62-07447, Appendix D.

(iv) The employer shall provide the medical surveillance required by this section, including multiple physician review under (m) of this subsection without cost to employees, and at a time and place that is reasonable and convenient to employees.

(v) The employer shall assure that the collecting and handling of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (B<sub>2</sub>-M) taken from employees under this section is done in a manner that assures their reliability and that analysis of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (B<sub>2</sub>-M) taken from employees under this section is performed in laboratories with demonstrated proficiency to perform the particular analysis. (See WAC 296-62-07451, Appendix F.)

(b) Initial examination.

(i) For employees covered by medical surveillance under (a)(i) of this subsection, the employer shall provide an initial medical examination. The examination shall be provided to those employees within 30 days after initial assignment to a job with exposure to cadmium or no later than 90 days after the effective date of this section, whichever date is later.

(ii) The initial medical examination shall include:

(A) A detailed medical and work history, with emphasis on: Past, present, and anticipated future exposure to cadmium; any history of renal, cardiovascular, respiratory, hematopoietic, reproductive, and/or musculo-skeletal system dysfunction; current usage of medication with potential nephrotoxic side-effects; and smoking history and current status; and

(B) Biological monitoring that includes the following tests:

(I) Cadmium in urine (CdU), standardized to grams of creatinine (g/Cr);

(II) Beta-2 microglobulin in urine (B<sub>2</sub>-M), standardized to grams of creatinine (g/Cr), with pH specified, as described in WAC 296-62-07451, Appendix F; and

(III) Cadmium in blood (CdB), standardized to liters of whole blood (lwb).

(ii) Recent examination: An initial examination is not required to be provided if adequate records show that the employee has been examined in accordance with the requirements of (b)(ii) of this subsection within the past 12 months. In that case, such records shall be maintained as part of the employee's medical record and the prior exam shall be treated as if it were an initial examination for the purposes of (c) and (d) of this subsection.

(c) Actions triggered by initial biological monitoring.

(i) If the results of the biological monitoring tests in the initial examination show the employee's CdU level to be at or below 3 µg/g Cr, B<sub>2</sub>-M level to be at or below 300 µg/g Cr and CdB level to be at or below 5 µg/lwb, then:

(A) For employees who are subject to medical surveillance under (a)(i)(A) of this subsection because of current or anticipated exposure to cadmium, the employer shall provide the minimum level of periodic medical surveillance in accordance with the requirements in (d)(i) of this subsection; and

(B) For employees who are subject to medical surveillance under (a)(i)(B) of this subsection because of prior but not current exposure, the employer shall provide biological monitoring for CdU, B<sub>2</sub>-M, and CdB one year after the initial biological monitoring and then the employer shall comply with the requirements of (d)(vi) of this subsection.

(ii) For all employees who are subject to medical surveillance under (a)(i) of this subsection, if the results of the initial biological monitoring tests show the level of CdU to exceed 3 µg/g Cr, the level of B<sub>2</sub>-M to be in excess of 300 µg/g Cr, or the level of CdB to be in excess of 5 µg/lwb, the employer shall:

(A) Within two weeks after receipt of biological monitoring results, reassess the employee's occupational exposure to cadmium as follows:

(I) Reassess the employee's work practices and personal hygiene;

(II) Reevaluate the employee's respirator use, if any, and the respirator program;

(III) Review the hygiene facilities;

(IV) Reevaluate the maintenance and effectiveness of the relevant engineering controls;

(V) Assess the employee's smoking history and status;

(B) Within 30 days after the exposure reassessment, specified in (c)(ii)(A) of this subsection, take reasonable steps to correct any deficiencies found in the reassessment that may be responsible for the employee's excess exposure to cadmium; and

(C) Within 90 days after receipt of biological monitoring results, provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. If the physician determines that medical removal is not necessary, then until the employee's CdU level falls to or below 3 µg/g Cr, B<sub>2</sub>-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

(I) Provide biological monitoring in accordance with (b)(ii)(B) of this subsection on a semiannual basis; and

(II) Provide annual medical examinations in accordance with (d)(ii) of this subsection.

(iii) For all employees who are subject to medical surveillance under (a)(i) of this subsection, if the results of the initial biological monitoring tests show the level of CdU to be in excess of 15 µg/g Cr, or the level of CdB to be in excess of 15 µg/lwb, or the level of B<sub>2</sub>-M to be in excess of 1,500 µg/g Cr, the employer shall comply with the requirements of (c)(ii)(A) and (B) of this subsection. Within 90 days after

receipt of biological monitoring results, the employer shall provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological monitoring results obtained during the medical examination both show that: CdU exceeds 15 µg/g Cr; or CdB exceeds 15 µg/lwb; or B<sub>2</sub>-M exceeds 1500 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this section. If the employee is not required to be removed by the mandatory provisions of this section or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, B<sub>2</sub>-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

(A) Periodically reassess the employee's occupational exposure to cadmium;

(B) Provide biological monitoring in accordance with (b)(ii)(B) of this subsection on a quarterly basis; and

(C) Provide semiannual medical examinations in accordance with (d)(ii) of this subsection.

(iv) For all employees to whom medical surveillance is provided, beginning on January 1, 1999, and in lieu of (c)(iii) of this subsection, whenever the results of initial biological monitoring tests show the employee's CdU level to be in excess of 7 µg/g Cr, or B<sub>2</sub>-M level to be in excess of 750 µg/g Cr, or CdB level to be in excess of 10 µg/lwb, the employer shall comply with the requirements of (c)(ii)(A) and (B) of this subsection. Within 90 days after receipt of biological monitoring results, the employer shall provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological monitoring results obtained during the medical examination both show that: CdU exceeds 7 µg/g Cr; or CdB exceeds 10 µg/lwb; or B<sub>2</sub>-M exceeds 750 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this section. If the employee is not required to be removed by the mandatory provisions of this section or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, B<sub>2</sub>-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

(A) Periodically reassess the employee's occupational exposure to cadmium;

(B) Provide biological monitoring in accordance with (b)(ii)(B) of this subsection on a quarterly basis; and

(C) Provide semiannual medical examinations in accordance with (d)(ii) of this subsection.

(d) Periodic medical surveillance.

(i) For each employee who is covered by medical surveillance under (a)(i)(A) of this subsection because of current or anticipated exposure to cadmium, the employer shall provide at least the minimum level of periodic medical surveillance, which consists of periodic medical examinations and periodic biological monitoring. A periodic medical examination shall be provided within one year after the initial examination required by (b) of this subsection and thereafter at least biennially. Biological sampling shall be provided at least annually either as part of a periodic medical examination or separately as periodic biological monitoring.

(ii) The periodic medical examination shall include:

(A) A detailed medical and work history, or update thereof, with emphasis on: Past, present, and anticipated future exposure to cadmium; smoking history and current status; reproductive history; current use of medications with potential nephrotoxic side-effects; any history of renal, cardiovascular, respiratory, hematopoietic, and/or musculoskeletal system dysfunction; and as part of the medical and work history, for employees who wear respirators, questions 3 through 11 and 25 through 32 in WAC 296-62-07447, Appendix D;

(B) A complete physical examination with emphasis on: Blood pressure, the respiratory system, and the urinary system;

(C) A 14 inch by 17 inch, or a reasonably standard sized posterior-anterior chest X ray (after the initial X ray, the frequency of chest X rays is to be determined by the examining physician);

(D) Pulmonary function tests, including forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV1);

(E) Biological monitoring, as required in (b)(ii)(B) of this subsection;

(F) Blood analysis, in addition to the analysis required under (b)(ii)(B) of this subsection, including blood urea nitrogen, complete blood count, and serum creatinine;

(G) Urinalysis, in addition to the analysis required under (b)(ii)(B) of this subsection, including the determination of albumin, glucose, and total and low molecular weight proteins;

(H) For males over 40 years old, prostate palpation, or other at least as effective diagnostic test(s); and

(I) Any additional tests or procedures deemed appropriate by the examining physician.

(iii) Periodic biological monitoring shall be provided in accordance with (b)(ii)(B) of this subsection.

(iv) If the results of periodic biological monitoring or the results of biological monitoring performed as part of the periodic medical examination show the level of the employee's CdU, B<sub>2</sub>-M, or CdB to be in excess of the levels specified in (c)(ii) and (iii) of this subsection; or, beginning on January 1, 1999, in excess of the levels specified in (c)(ii) or (iv) of this subsection, the employer shall take the appropriate actions

specified in (c)(ii) through (iv) of this subsection, respectively.

(v) For previously exposed employees under (a)(i)(B) of this subsection:

(A) If the employee's levels of CdU did not exceed 3 µg/g Cr, CdB did not exceed 5 µg/lwb, and B<sub>2</sub>-M did not exceed 300 µg/g Cr in the initial biological monitoring tests, and if the results of the follow-up biological monitoring required by (c)(i)(B) of this subsection one year after the initial examination confirm the previous results, the employer may discontinue all periodic medical surveillance for that employee.

(B) If the initial biological monitoring results for CdU, CdB, or B<sub>2</sub>-M were in excess of the levels specified in (c)(i) of this subsection, but subsequent biological monitoring results required by (c)(ii) through (iv) of this subsection show that the employee's CdU levels no longer exceed 3 µg/g Cr, CdB levels no longer exceed 5 µg/lwb, and B<sub>2</sub>-M levels no longer exceed 300 µg/g Cr, the employer shall provide biological monitoring for CdU, CdB, and B<sub>2</sub>-M one year after these most recent biological monitoring results. If the results of the follow-up biological monitoring specified in this section, confirm the previous results, the employer may discontinue all periodic medical surveillance for that employee.

(C) However, if the results of the follow-up tests specified in (d)(v)(A) or (B) of this subsection indicate that the level of the employee's CdU, B<sub>2</sub>-M, or CdB exceeds these same levels, the employer is required to provide annual medical examinations in accordance with the provisions of (d)(ii) of this subsection until the results of biological monitoring are consistently below these levels or the examining physician determines in a written medical opinion that further medical surveillance is not required to protect the employee's health.

(vi) A routine, biennial medical examination is not required to be provided in accordance with (c)(i) and (d) of this subsection if adequate medical records show that the employee has been examined in accordance with the requirements of (d)(ii) of this subsection within the past 12 months. In that case, such records shall be maintained by the employer as part of the employee's medical record, and the next routine, periodic medical examination shall be made available to the employee within two years of the previous examination.

(e) Actions triggered by medical examinations. If the results of a medical examination carried out in accordance with this section indicate any laboratory or clinical finding consistent with cadmium toxicity that does not require employer action under (b), (c), or (d) of this subsection, the employer shall take the following steps and continue to take them until the physician determines that they are no longer necessary.

(i) Periodically reassess: The employee's work practices and personal hygiene; the employee's respirator use, if any; the employee's smoking history and status; the respiratory protection program; the hygiene facilities; the maintenance and effectiveness of the relevant engineering controls; and take all reasonable steps to correct the deficiencies found in the reassessment that may be responsible for the employee's excess exposure to cadmium.

(ii) Provide semiannual medical reexaminations to evaluate the abnormal clinical sign(s) of cadmium toxicity until the results are normal or the employee is medically removed; and

(iii) Where the results of tests for total proteins in urine are abnormal, provide a more detailed medical evaluation of the toxic effects of cadmium on the employee's renal system.

(f) Examination for respirator use.

(i) To determine an employee's fitness for respirator use, the employer shall provide a medical examination that includes the elements specified in (f)(i)(A) through (D) of this subsection. This examination shall be provided prior to the employee's being assigned to a job that requires the use of a respirator or no later than 90 days after this section goes into effect, whichever date is later, to any employee without a medical examination within the preceding 12 months that satisfies the requirements of this section.

(A) A detailed medical and work history, or update thereof, with emphasis on: Past exposure to cadmium; smoking history and current status; any history of renal, cardiovascular, respiratory, hematopoietic, and/or musculo-skeletal system dysfunction; a description of the job for which the respirator is required; and questions 3 through 11 and 25 through 32 in WAC 296-62-07447, Appendix D;

(B) A blood pressure test;

(C) Biological monitoring of the employee's levels of CdU, CdB and B<sub>2</sub>-M in accordance with the requirements of (b)(ii)(B) of this subsection, unless such results already have been obtained within the twelve months; and

(D) Any other test or procedure that the examining physician deems appropriate.

(ii) After reviewing all the information obtained from the medical examination required in (f)(i) of this subsection, the physician shall determine whether the employee is fit to wear a respirator.

(iii) Whenever an employee has exhibited difficulty in breathing during a respirator fit test or during use of a respirator, the employer, as soon as possible, shall provide the employee with a periodic medical examination in accordance with (d)(ii) of this subsection to determine the employee's fitness to wear a respirator.

(iv) Where the results of the examination required under (f)(i), (ii), or (iii) of this subsection are abnormal, medical limitation or prohibition of respirator use shall be considered. If the employee is allowed to wear a respirator, the employee's ability to continue to do so shall be periodically evaluated by a physician.

(g) Emergency examinations.

(i) In addition to the medical surveillance required in (b) through (f) of this subsection, the employer shall provide a medical examination as soon as possible to any employee who may have been acutely exposed to cadmium because of an emergency.

(ii) The examination shall include the requirements of (d)(ii), of this subsection, with emphasis on the respiratory system, other organ systems considered appropriate by the examining physician, and symptoms of acute overexposure, as identified in Appendix A, WAC 296-62-07441 (2)(b)(i) and (ii) and (4).

(h) Termination of employment examination.

(i) At termination of employment, the employer shall provide a medical examination in accordance with (d)(ii) of this subsection, including a chest X ray where necessary, to any employee to whom at any prior time the employer was required to provide medical surveillance under (a)(i) or (g) of this subsection. However, if the last examination satisfied the requirements of (d)(ii) of this subsection and was less than six months prior to the date of termination, no further examination is required unless otherwise specified in (c) or (e) of this subsection;

(ii) In addition, if the employer has discontinued all periodic medical surveillance under (d)(v) of this subsection, no termination of employment medical examination is required.

(i) Information provided to the physician. The employer shall provide the following information to the examining physician:

(i) A copy of this standard and appendices;

(ii) A description of the affected employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to cadmium;

(iii) The employee's former, current, and anticipated future levels of occupational exposure to cadmium;

(iv) A description of any personal protective equipment, including respirators, used or to be used by the employee, including when and for how long the employee has used that equipment; and

(v) Relevant results of previous biological monitoring and medical examinations.

(j) Physician's written medical opinion.

(i) The employer shall promptly obtain a written, signed, medical opinion from the examining physician for each medical examination performed on each employee. This written opinion shall contain:

(A) The physician's diagnosis for the employee;

(B) The physician's opinion as to whether the employee has any detected medical condition(s) that would place the employee at increased risk of material impairment to health from further exposure to cadmium, including any indications of potential cadmium toxicity;

(C) The results of any biological or other testing or related evaluations that directly assess the employee's absorption of cadmium;

(D) Any recommended removal from, or limitation on the activities or duties of the employee or on the employee's use of personal protective equipment, such as respirators;

(E) A statement that the physician has clearly and carefully explained to the employee the results of the medical examination, including all biological monitoring results and any medical conditions related to cadmium exposure that require further evaluation or treatment, and any limitation on the employee's diet or use of medications.

(ii) The employer shall promptly obtain a copy of the results of any biological monitoring provided by an employer to an employee independently of a medical examination under (b) and (d) of this subsection, and, in lieu of a written medical opinion, an explanation sheet explaining those results.

(iii) The employer shall instruct the physician not to reveal orally or in the written medical opinion given to the employer specific findings or diagnoses unrelated to occupational exposure to cadmium.

(k) Medical removal protection (MRP).

(i) General.

(A) The employer shall temporarily remove an employee from work where there is excess exposure to cadmium on each occasion that medical removal is required under (c), (d), or (f) of this subsection and on each occasion that a physician determines in a written medical opinion that the employee should be removed from such exposure. The physician's determination may be based on biological monitoring results, inability to wear a respirator, evidence of illness, other signs or symptoms of cadmium-related dysfunction or disease, or any other reason deemed medically sufficient by the physician.

(B) The employer shall medically remove an employee in accordance with (k) of this subsection regardless of whether at the time of removal a job is available into which the removed employee may be transferred.

(C) Whenever an employee is medically removed under (k) of this subsection, the employer shall transfer the removed employee to a job where the exposure to cadmium is within the permissible levels specified in subsection (12) of this section as soon as one becomes available.

(D) For any employee who is medically removed under the provisions of (k)(i) of this subsection, the employer shall provide follow-up medical examinations semiannually until, in a written medical opinion, the examining physician determines that either the employee may be returned to his/her former job status or the employee must be permanently removed from excess cadmium exposure.

(E) The employer may not return an employee who has been medically removed for any reason to his/her former job status until a physician determines in a written medical opinion that continued medical removal is no longer necessary to protect the employee's health.

(ii) Where an employee is found unfit to wear a respirator under (f)(ii) of this subsection, the employer shall remove the employee from work where exposure to cadmium is above the PEL.

(iii) Where removal is based upon any reason other than the employee's inability to wear a respirator, the employer shall remove the employee from work where exposure to cadmium is at or above the action level.

(iv) Except as specified in (k)(v) of this subsection, no employee who was removed because his/her level of CdU, CdB and/or B<sub>2</sub>-M exceeded the trigger levels in (c) or (d) of this subsection may be returned to work with exposure to cadmium at or above the action level until the employee's levels of CdU fall to or below 3 µg/g Cr, CdB fall to or below 5 µg/lwb, and B<sub>2</sub>-M fall to or below 300 µg/g Cr.

(v) However, when in the examining physician's opinion continued exposure to cadmium will not pose an increased risk to the employee's health and there are special circumstances that make continued medical removal an inappropriate remedy, the physician shall fully discuss these matters with the employee, and then in a written determination may return a worker to his/her former job status despite what would otherwise be unacceptably high biological monitoring results. Thereafter and until such time as the employee's biological monitoring results have decreased to levels where he/she could have been returned to his/her former job status,

the returned employee shall continue medical surveillance as if he/she were still on medical removal. Until such time, the employee is no longer subject to mandatory medical removal. Subsequent questions regarding the employee's medical removal shall be decided solely by a final medical determination.

(vi) Where an employer, although not required by this section to do so, removes an employee from exposure to cadmium or otherwise places limitations on an employee due to the effects of cadmium exposure on the employee's medical condition, the employer shall provide the same medical removal protection benefits to that employee under (l) of this subsection as would have been provided had the removal been required under (k) of this subsection.

(l) Medical removal protection benefits.

(i) The employer shall provide medical removal protection benefits to an employee for up to a maximum of 18 months each time, and while the employee is temporarily medically removed under (k) of this subsection.

(ii) For purposes of this section, the requirement that the employer provide medical removal protection benefits means that the employer shall maintain the total normal earnings, seniority, and all other employee rights and benefits of the removed employee, including the employee's right to his/her former job status, as if the employee had not been removed from the employee's job or otherwise medically limited.

(iii) Where, after 18 months on medical removal because of elevated biological monitoring results, the employee's monitoring results have not declined to a low enough level to permit the employee to be returned to his/her former job status:

(A) The employer shall make available to the employee a medical examination pursuant to this section in order to obtain a final medical determination as to whether the employee may be returned to his/her former job status or must be permanently removed from excess cadmium exposure; and

(B) The employer shall assure that the final medical determination indicates whether the employee may be returned to his/her former job status and what steps, if any, should be taken to protect the employee's health.

(iv) The employer may condition the provision of medical removal protection benefits upon the employee's participation in medical surveillance provided in accordance with this section.

(m) Multiple physician review.

(i) If the employer selects the initial physician to conduct any medical examination or consultation provided to an employee under this section, the employee may designate a second physician to:

(A) Review any findings, determinations, or recommendations of the initial physician; and

(B) Conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

(ii) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician provided by the employer conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, multiple physician review upon the employee doing the

following within fifteen (15) days after receipt of this notice, or receipt of the initial physician's written opinion, whichever is later:

(A) Informing the employer that he or she intends to seek a medical opinion; and

(B) Initiating steps to make an appointment with a second physician.

(iii) If the findings, determinations, or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

(iv) If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee, through their respective physicians, shall designate a third physician to:

(A) Review any findings, determinations, or recommendations of the other two physicians; and

(B) Conduct such examinations, consultations, laboratory tests, and discussions with the other two physicians as the third physician deems necessary to resolve the disagreement among them.

(v) The employer shall act consistently with the findings, determinations, and recommendations of the third physician, unless the employer and the employee reach an agreement that is consistent with the recommendations of at least one of the other two physicians.

(n) Alternate physician determination. The employer and an employee or designated employee representative may agree upon the use of any alternate form of physician determination in lieu of the multiple physician review provided by (m) of this subsection, so long as the alternative is expeditious and at least as protective of the employee.

(o) Information the employer must provide the employee.

(i) The employer shall provide a copy of the physician's written medical opinion to the examined employee within five working days after receipt thereof.

(ii) The employer shall provide the employee with a copy of the employee's biological monitoring results and an explanation sheet explaining the results within five working days after receipt thereof.

(iii) Within 30 days after a request by an employee, the employer shall provide the employee with the information the employer is required to provide the examining physician under (i) of this subsection.

(p) Reporting. In addition to other medical events that are required to be reported on the OSHA Form No. 200, the employer shall report any abnormal condition or disorder caused by occupational exposure to cadmium associated with employment as specified in Chapter (V)(E) of the Bureau of Labor Statistics Recordkeeping Guidelines for Occupational Injuries and Illnesses.

(13) Communication of cadmium hazards to employees

(a) General. In communications concerning cadmium hazards, employers shall comply with the requirements of WISHA's Hazard Communication Standard, chapter 296-62 WAC, Part C, including but not limited to the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training. In

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addition, employers shall comply with the following requirements:

(b) Warning signs.

(i) Warning signs shall be provided and displayed in regulated areas. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.

(ii) Warning signs required by (b)(i) of this subsection shall bear the following information:

Danger, Cadmium, Cancer Hazard, Can Cause Lung and  
Kidney Disease, Authorized Personnel Only, Respirators  
Required in This Area

(iii) The employer shall assure that signs required by this section are illuminated, cleaned, and maintained as necessary so that the legend is readily visible.

(c) Warning labels.

(i) Shipping and storage containers containing cadmium, cadmium compounds, or cadmium contaminated clothing, equipment, waste, scrap, or debris shall bear appropriate warning labels, as specified in (c)(ii) of this subsection.

(ii) The warning labels shall include at least the following information:

Danger, Contains Cadmium, Cancer Hazard, Avoid Creating  
Dust, Can Cause Lung and Kidney Disease

(iii) Where feasible, installed cadmium products shall have a visible label or other indication that cadmium is present.

(d) Employee information and training.

(i) The employer shall institute a training program for all employees who are potentially exposed to cadmium, assure employee participation in the program, and maintain a record of the contents of such program.

(ii) Training shall be provided prior to or at the time of initial assignment to a job involving potential exposure to cadmium and at least annually thereafter.

(iii) The employer shall make the training program understandable to the employee and shall assure that each employee is informed of the following:

(A) The health hazards associated with cadmium exposure, with special attention to the information incorporated in WAC 296-62-07441, Appendix A;

(B) The quantity, location, manner of use, release, and storage of cadmium in the workplace and the specific nature of operations that could result in exposure to cadmium, especially exposures above the PEL;

(C) The engineering controls and work practices associated with the employee's job assignment;

(D) The measures employees can take to protect themselves from exposure to cadmium, including modification of such habits as smoking and personal hygiene, and specific procedures the employer has implemented to protect employees from exposure to cadmium such as appropriate work practices, emergency procedures, and the provision of personal protective equipment;

(E) The purpose, proper selection, fitting, proper use, and limitations of respirators and protective clothing;

(F) The purpose and a description of the medical surveillance program required by subsection (12) of this section;

(G) The contents of this section and its appendices; and

(H) The employee's rights of access to records under chapter 296-62 WAC, Part B.

(iv) Additional access to information and training program and materials.

(A) The employer shall make a copy of this section and its appendices readily available to all affected employees and shall provide a copy without cost if requested.

(B) Upon request, the employer shall provide to the director or authorized representative, all materials relating to the employee information and the training program.

(e) Multiemployer workplace. In a multiemployer workplace, an employer who produces, uses, or stores cadmium in a manner that may expose employees of other employers to cadmium shall notify those employers of the potential hazard in accordance with WAC 296-800-170 of the chemical hazard communication program standard.

(14) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and keep an accurate record of all air monitoring for cadmium in the workplace.

(ii) This record shall include at least the following information:

(A) The monitoring date, shift, duration, air volume, and results in terms of an 8-hour TWA of each sample taken, and if cadmium is not detected, the detection level;

(B) The name, Social Security number, and job classification of all employees monitored and of all other employees whose exposures the monitoring result is intended to represent, including, where applicable, a description of how it was determined that the employee's monitoring result could be taken to represent other employee's exposures;

(C) A description of the sampling and analytical methods used and evidence of their accuracy;

(D) The type of respiratory protective device, if any, worn by the monitored employee and by any other employee whose exposure the monitoring result is intended to represent;

(E) A notation of any other conditions that might have affected the monitoring results;

(F) Any exposure monitoring or objective data that were used and the levels.

(iii) The employer shall maintain this record for at least thirty (30) years, in accordance with chapter 296-802 WAC.

(iv) The employer shall also provide a copy of the results of an employee's air monitoring prescribed in subsection (4) of this section to an industry trade association and to the employee's union, if any, or, if either of such associations or unions do not exist, to another comparable organization that is competent to maintain such records and is reasonably accessible to employers and employees in the industry.

(b) Objective data for exemption from requirement for initial monitoring.

(i) For purposes of this section, objective data are information demonstrating that a particular product or material containing cadmium or a specific process, operation, or activity involving cadmium cannot release dust or fumes in concentrations at or above the action level even under the worst-case release conditions. Objective data can be obtained from

an industry-wide study or from laboratory product test results from manufacturers of cadmium-containing products or materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

(ii) The employer shall maintain the record for at least 30 years of the objective data relied upon.

(c) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee covered by medical surveillance under (a)(i) of this subsection.

(ii) The record shall include at least the following information about the employee:

(A) Name, Social Security number, and description of duties;

(B) A copy of the physician's written opinions and of the explanation sheets for biological monitoring results;

(C) A copy of the medical history, and the results of any physical examination and all test results that are required to be provided by this section, including biological tests, X rays, pulmonary function tests, etc., or that have been obtained to further evaluate any condition that might be related to cadmium exposure;

(D) The employee's medical symptoms that might be related to exposure to cadmium; and

(E) A copy of the information provided to the physician as required by subsection (12)(i) of this section.

(iii) The employer shall assure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with chapter 296-802 WAC.

(iv) At the employee's request, the employer shall promptly provide a copy of the employee's medical record, or update as appropriate, to a medical doctor or a union specified by the employee.

(d) Training. The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification records shall be prepared at the completion of training and shall be maintained on file for one (1) year beyond the date of training of that employee.

(e) Availability.

(i) Except as otherwise provided for in this section, access to all records required to be maintained by (a) through (d) of this subsection shall be in accordance with the provisions of chapter 296-802 WAC.

(ii) Within 15 days after a request, the employer shall make an employee's medical records required to be kept by (c) of this subsection available for examination and copying to the subject employee, to designated representatives, to anyone having the specific written consent of the subject employee, and after the employee's death or incapacitation, to the employee's family members.

(f) Transfer of records. Whenever an employer ceases to do business and there is no successor employer or designated organization to receive and retain records for the prescribed period, the employer shall comply with the requirements concerning transfer of records set forth in chapter 296-802 WAC.

(15) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to cadmium.

(b) Observation procedures. When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with that clothing and equipment and shall assure that the observer uses such clothing and equipment and complies with all other applicable safety and health procedures.

(16) Appendices.

(a) Compliance with the fit testing requirements in WAC 296-842-15005 are mandatory.

(b) Except where portions of WAC 296-62-07441, 296-62-07443, 296-62-07447, 296-62-07449, and 296-62-07451, Appendices A, B, D, E, and F, respectively, to this section are expressly incorporated in requirements of this section, these appendices are purely informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-155-174, filed 1/18/05, effective 3/1/05; 04-10-026, § 296-155-174, filed 4/27/04, effective 8/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 01-11-038, § 296-155-174, filed 5/9/01, effective 9/1/01; 99-10-071, § 296-155-174, filed 5/4/99, effective 9/1/99. Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-174, filed 7/20/94, effective 9/20/94; 93-21-075 (Order 93-06), § 296-155-174, filed 10/20/93, effective 12/1/93; 93-07-044 (Order 93-01), § 296-155-174, filed 3/13/93, effective 4/27/93.]

#### WAC 296-155-176 Lead.

[Statutory Authority: Chapter 49.17 RCW, 93-22-054 (Order 93-07), § 296-155-176, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17603 Scope.** WAC 296-155-176, Lead, applies to all construction work where an employee may be occupationally exposed to lead. All construction work excluded from coverage in the general industry standard for lead by WAC 296-62-07521 (1)(b) is covered by this standard. Construction work is defined as work for construction, alteration and/or repair, including painting and decorating. It includes but is not limited to the following:

(1) Demolition or salvage of structures where lead or materials containing lead are present;

(2) Removal or encapsulation of materials containing lead;

(3) New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;

(4) Installation of products containing lead;

(5) Lead contamination/emergency cleanup;

(6) Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and

(7) Maintenance operations associated with the construction activities described in this section.

[Statutory Authority: Chapter 49.17 RCW, 93-22-054 (Order 93-07), § 296-155-17603, filed 10/29/93, effective 12/10/93.]

(2007 Ed.)

**WAC 296-155-17605 Definitions.** (1) Action level means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30  $\mu\text{g}/\text{m}^3$ ) calculated as an 8-hour time-weighted average (TWA).

(2) Competent person means one who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them.

(3) Director means the director of labor and industries, or his/her designated representative.

(4) Lead means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

(5) This section means WAC 296-155-176 through 296-155-17656.

[Statutory Authority: Chapter 49.17 RCW, 93-22-054 (Order 93-07), § 296-155-17605, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17607 Permissible exposure limit.** (1) The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50  $\mu\text{g}/\text{m}^3$ ) averaged over an 8-hour period.

(2) If an employee is exposed to lead for more than 8 hours in any work day the employees' allowable exposure, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

*Allowable employee exposure (in  $\mu\text{g}/\text{m}^3$ ) = 400 divided by hours worked in the day.*

(3) When respirators are used to limit employee exposure as required by this section and all the requirements of WAC 296-155-17611(1) and 296-155-17613 have been met, employee exposure may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

[Statutory Authority: Chapter 49.17 RCW, 93-22-054 (Order 93-07), § 296-155-17607, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17609 Exposure assessment.** (1) General.

(a) Each employer who has a workplace or operation covered by this standard shall initially determine if any employee may be exposed to lead at or above the action level.

(b) For the purposes of this section, employee exposure is that exposure which would occur if the employee were not using a respirator.

(c) With the exception of monitoring under subsection (3) of this section, where monitoring is required by this standard, the employer shall collect personal samples representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level.

(d) Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

(2) Protection of employees during assessment of exposure.

(a) With respect to the lead related tasks listed in this subdivision, where lead is present, until the employer per-

forms an employee exposure assessment as required in this section and documents that the employee performing any of the listed tasks is not exposed above the PEL, the employer shall treat the employee as if the employee were exposed above the PEL, and not in excess of ten (10) times the PEL, and shall implement employee protective measures prescribed in subdivision (e) of this subsection. The tasks covered by this requirement are:

(i) Where lead containing coatings or paint are present: Manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems;

(ii) Spray painting with lead paint.

(b) In addition, with regard to tasks not listed in subdivision (a), where the employer has any reason to believe that an employee performing the task may be exposed to lead in excess of the PEL, until the employer performs an employee exposure assessment as required by this section and documents that the employee's lead exposure is not above the PEL the employer shall treat the employee as if the employee were exposed above the PEL and shall implement employee protective measures as prescribed in subdivision (e) of this subsection.

(c) With respect to the tasks listed in this subdivision, where lead is present, until the employer performs an employee exposure assessment as required in this section, and documents that the employee performing any of the listed tasks is not exposed in excess of 500  $\mu\text{g}/\text{m}^3$ , the employer shall treat the employee as if the employee were exposed to lead in excess of 500  $\mu\text{g}/\text{m}^3$  and shall implement employee protective measures as prescribed in subdivision (e) of this subsection. Where the employer does establish that the employee is exposed to levels of lead below 500  $\mu\text{g}/\text{m}^3$ , the employer may provide the exposed employee with the appropriate respirator prescribed for such use at such lower exposures, in accordance with Table 1 of WAC 296-155-17613. The tasks covered by this requirement are:

(i) Using lead containing mortar; lead burning;

(ii) Where lead containing coatings or paint are present: Rivet busting; power tool cleaning without dust collection systems; cleanup activities where dry expendable abrasives are used; and abrasive blasting enclosure movement and removal.

(d) With respect to the tasks listed in this subdivision, where lead is present, until the employer performs an employee exposure assessment as required in this section and documents that the employee performing any of the listed tasks is not exposed to lead in excess of 2,500  $\mu\text{g}/\text{m}^3$  (50xPEL), the employer shall treat the employee as if the employee were exposed to lead in excess of 2,500  $\mu\text{g}/\text{m}^3$  and shall implement employee protective measures as prescribed in (e) of this subsection. Where the employer does establish that the employee is exposed to levels of lead below 2,500  $\mu\text{g}/\text{m}^3$ , the employer may provide the exposed employee with the appropriate respirator prescribed for use at such lower exposures, in accordance with Table I of this WAC 296-155-17613. Protection described in this section is required where lead containing coatings or paint are present on structures when performing:

(i) Abrasive blasting;

(ii) Welding;

(iii) Cutting; and

(iv) Torch burning.

(e) Until the employer performs an employee exposure assessment as required by this section and determines actual employee exposure, the employer shall provide to employees performing the tasks described in (a) through (d) of this subsection with interim protection as follows:

(i) Appropriate respiratory protection in accordance with WAC 296-155-17613.

(ii) Appropriate personal protective clothing and equipment in accordance with WAC 296-155-17615.

(iii) Change areas in accordance with WAC 296-155-17619(2).

(iv) Hand washing facilities in accordance with WAC 296-155-17619(5).

(v) Biological monitoring in accordance with WAC 296-155-17621 (1)(a), to consist of blood sampling and analysis for lead and zinc protoporphyrin levels, and

(vi) Training as required by WAC 296-155-17625 (1)(a) regarding WAC 296-800-170, Chemical hazard communication; training as required by WAC 296-155-17625 (2)(c), regarding use of respirators; and training in accordance with WAC 296-155-100.

(3) Basis of initial determination.

(a) Except as provided by (c) and (d) of this subsection the employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

(i) Any information, observations, or calculations which would indicate employee exposure to lead;

(ii) Any previous measurements of airborne lead; and

(iii) Any employee complaints of symptoms which may be attributable to exposure to lead.

(b) Monitoring for the initial determination where performed may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

(c) Where the employer has previously monitored for lead exposures, and the data were obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of subdivision (a) of this subsection and subsection (5) of this section if the sampling and analytical methods meet the accuracy and confidence levels of subsection (9) of this section.

(d) Where the employer has objective data, demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

(i) The employer shall establish and maintain an accurate record documenting the nature and relevancy of objective

data as specified in WAC 296-155-17629(4), where used in assessing employee exposure in lieu of exposure monitoring.

(ii) Objective data, as described in subdivision (d) of this subsection, is not permitted to be used for exposure assessment in connection with subsection (2) of this section.

(4) Positive initial determination and initial monitoring.

(a) Where a determination conducted under subsections (1), (2) and (3) of this section shows the possibility of any employee exposure at or above the action level the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

(b) Where the employer has previously monitored for lead exposure, and the data were obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of (a) of this subsection if the sampling and analytical methods meet the accuracy and confidence levels of subsection (9) of this section.

(5) Negative initial determination. Where a determination, conducted under subsections (1), (2), and (3) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level the employer shall make a written record of such determination. The record shall include at least the information specified in subsection (3)(a) of this section and shall also include the date of determination, location within the worksite, and the name and social security number of each employee monitored.

(6) Frequency.

(a) If the initial determination reveals employee exposure to be below the action level further exposure determination need not be repeated except as otherwise provided in subsection (7) of this section.

(b) If the initial determination or subsequent determination reveals employee exposure to be at or above the action level but at or below the PEL the employer shall perform monitoring in accordance with this section at least every 6 months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subsection (7) of this section.

(c) If the initial determination reveals that employee exposure is above the PEL the employer shall perform monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are at or below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in subdivision (b) of this subsection, except as otherwise provided in subsection (7) of this section. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subsection (7) of this section.

(2007 Ed.)

(7) Additional exposure assessments. Whenever there has been a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level or may result in employees already exposed at or above the action level being exposed above the PEL, the employer shall conduct additional monitoring in accordance with this section.

(8) Employee notification.

(a) Within 5 working days after completion of the exposure assessment the employer shall notify each employee in writing of the results which represent that employee's exposure.

(b) Whenever the results indicate that the representative employee exposure, without regard to respirators, is at or above the PEL the employer shall include in the written notice a statement that the employee's exposure was at or above that level and a description of the corrective action taken or to be taken to reduce exposure to below that level.

(9) Accuracy of measurement. The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of 95 percent) of not less than plus or minus 25 percent for airborne concentrations of lead equal to or greater than 30  $\mu\text{g}/\text{m}^3$ .

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-17609, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17609, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17611 Methods of compliance. (1)**

Engineering and work practice controls. The employer shall implement engineering and work practice controls, including administrative controls, to reduce and maintain employee exposure to lead to or below the permissible exposure limit to the extent that such controls are feasible. Wherever all feasible engineering and work practices controls that can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit prescribed in WAC 296-155-17607, the employer shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them by the use of respiratory protection that complies with the requirements of WAC 296-155-17613.

(2) Compliance program.

(a) Prior to commencement of the job each employer shall establish and implement a written compliance program to achieve compliance with WAC 296-155-17607.

(b) Written plans for these compliance programs shall include at least the following:

(i) A description of each activity in which lead is emitted; e.g., equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

(ii) A description of the specific means that will be employed to achieve compliance and, where engineering controls are required engineering plans and studies used to determine methods selected for controlling exposure to lead;

(iii) A report of the technology considered in meeting the PEL;

(iv) Air monitoring data which documents the source of lead emissions;

(v) A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

(vi) A work practice program which includes under requirements in WAC 296-155-17615, 296-155-17617, and 296-155-17619, and incorporates other relevant work practices such as those specified in subsection (5) of this section;

(vii) An administrative control schedule required by subsection (4) of this section, if applicable;

(viii) Other relevant information.

(c) The compliance program shall provide for frequent and regular inspections of job sites, materials, and equipment to be made by a competent person.

(d) Written programs shall be submitted upon request to any affected employee or authorized employee representatives, and the director, and shall be available at the worksite for examination and copying by the director.

(e) Written programs shall be revised and updated at least every 6 months to reflect the current status of the program.

(3) Mechanical ventilation. When ventilation is used to control lead exposure, the employer shall evaluate the mechanical performance of the system in controlling exposure as necessary to maintain its effectiveness.

(4) Administrative controls. If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

(a) Name or identification number of each affected employee;

(b) Duration and exposure levels at each job or work station where each affected employee is located; and

(c) Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

(5) The employer shall ensure that, to the extent relevant, employees follow good work practices such as described in Appendix B, WAC 296-155-17652.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17611, filed 10/29/93, effective 12/10/93.]

### **WAC 296-155-17613 Respiratory protection. (1)**

**General.** For employees who use respirators required by WAC 296-155-176, the employer must provide respirators that comply with the requirements of this section. Respirators must be used during:

(a) Periods when an employee's exposure to lead exceeds the PEL.

(b) Work operations for which engineering controls and work-practices are not sufficient to reduce employee exposures to or below the PEL.

(c) Periods when an employee requests a respirator.

(d) Periods when respirators are required to provide interim protection of employees while they perform the operations as specified in WAC 296-155-17609(2).

(2) Respirator program.

(a) The employer must implement a respiratory protection program as required by chapter 296-842 WAC, except WAC 296-842-13005 and 296-842-14005.

(b) If an employee has breathing difficulty during fit testing or respirator use, the employer must provide the

employee with a medical examination as required by WAC 296-155-17621 (3)(a)(ii) to determine whether or not the employee can use a respirator while performing the required duty.

(3) Respirator selection.

(a) The employer must select the appropriate respirator or combination of respirators from Table I of this section.

(b) The employer must provide a powered air-purifying respirator when an employee chooses to use such a respirator and it will provide adequate protection to the employee.

Table I.— Respiratory Protection for Lead Aerosols

Airborne concentration of lead or condition of use	Required respirator <sup>a</sup>
Not in excess of 500 µg/m <sup>3</sup>	1/2 mask air purifying respirator with high efficiency filters. <sup>b, c</sup> 1/2 mask supplied air respirator operated in demand (negative pressure) mode.
Not in excess of 1,250 µg/m <sup>3</sup>	Loose fitting hood or helmet powered air purifying respirator with high efficiency filters. <sup>c</sup> Hood or helmet supplied air respirator operated in a continuous-flow mode—e.g., type CE abrasive blasting respirators operated in a continuous-flow mode.
Not in excess of 2,500 µg/m <sup>3</sup>	Full facepiece air purifying respirator with high efficiency filters. <sup>c</sup> Tight fitting powered air purifying respirator with high efficiency filters. <sup>c</sup> Full facepiece supplied air respirator operated in demand mode. 1/2 mask or full facepiece supplied air respirator operated in a continuous-flow mode. Full facepiece self-contained breathing apparatus (SCBA) operated in demand mode.
Not in excess of 50,000 µg/m <sup>3</sup>	1/2 mask supplied air respirator operated in pressure demand or other positive-pressure mode.
Not in excess of 100,000 µg/m	Full facepiece supplied air respirator operated in pressure demand or other positive-pressure mode—e.g., type CE abrasive blasting respirators operated in a positive-pressure mode.
Greater than 100,000 µg/m <sup>3</sup> unknown concentration, or fire fighting	Full facepiece SCBA operated in pressure demand or other positive pressure mode.

<sup>a</sup> Respirators specified for higher concentrations can be used at lower concentrations of lead.

<sup>b</sup> Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

<sup>c</sup> A high efficiency particulate filter (HEPA) means a filter that is 99.97 percent efficient against particles of 0.3 micron size or larger.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-155-17613, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050, 99-10-071, § 296-155-17613, filed 5/4/99, effective 9/1/99. Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17613, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17615 Protective work clothing and equipment. (1)** Provision and use. Where an employee is exposed to lead above the PEL without regard to the use of respirators, where employees are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), and as protection for employees performing tasks as specified in WAC 296-155-17609(2), the employer shall provide at no cost to the employee and assure that the

employee uses appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments such as, but not limited to:

- (a) Coveralls or similar full-body work clothing;
- (b) Gloves, hats, and shoes or disposable shoe coverlets; and
- (c) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-800-160.

(2) Cleaning and replacement.

(a) The employer shall provide the protective clothing required in subsection (1) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 µg/m<sup>3</sup> of lead as an 8-hour TWA.

(b) The employer shall provide for the cleaning, laundering, and disposal of protective clothing and equipment required by subsection (1) of this section.

(c) The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness.

(d) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change areas provided for that purpose as prescribed in WAC 296-155-17619(2).

(e) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area which prevents dispersion of lead outside the container.

(f) The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

(g) The employer shall assure that the containers of contaminated protective clothing and equipment required by subdivision (e) of this subsection are labeled as follows:

Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state, or federal regulations.

(h) The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-17615, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17615, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17617 Housekeeping.** (1) All surfaces shall be maintained as free as practicable of accumulations of lead.

(2) Clean-up of floors and other surfaces where lead accumulates shall wherever possible, be cleaned by vacuuming or other methods that minimize the likelihood of lead becoming airborne.

(3) Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

(4) Where vacuuming methods are selected, the vacuums shall be equipped with HEPA filters and used and emptied in a manner which minimizes the reentry of lead into the workplace.

(2007 Ed.)

(5) Compressed air shall not be used to remove lead from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the airborne dust created by the compressed air.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17617, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17619 Hygiene facilities and practices.** (1) The employer shall assure that in areas where employees are exposed to lead above the PEL without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied.

(2) Change areas.

(a) The employer shall provide clean change areas for employees whose airborne exposure to lead is above the PEL, and as protection for employees performing tasks as specified in WAC 296-155-17609(2), without regard to the use of respirators.

(b) The employer shall assure that change areas are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

(c) The employer shall assure that employees do not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift.

(3) Showers.

(a) The employer shall provide shower facilities, where feasible, for use by employees whose airborne exposure to lead is above the PEL.

(b) The employer shall assure, where shower facilities are available, that employees shower at the end of the work shift and shall provide an adequate supply of cleansing agents and towels for use by affected employees.

(4) Eating facilities.

(a) The employer shall provide lunchroom facilities or eating areas for employees whose airborne exposure to lead is above the PEL, without regard to the use of respirators.

(b) The employer shall assure that lunchroom facilities or eating areas are as free as practicable from lead contamination and are readily accessible to employees.

(c) The employer shall assure that employees whose airborne exposure to lead is above the PEL, without regard to the use of a respirator, wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

(d) The employer shall assure that employees do not enter lunchroom facilities or eating areas with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method that limits dispersion of lead dust.

(5) Hand washing facilities.

(a) The employer shall provide adequate handwashing facilities for use by employees exposed to lead in accordance with WAC 296-155-140.

(b) Where showers are not provided the employer shall assure that employees wash their hands and face at the end of the work-shift.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17619, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17621 Medical surveillance.** (1) General.

(a) The employer shall make available initial medical surveillance to employees occupationally exposed on any day to lead at or above the action level. Initial medical surveillance consists of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels.

(b) The employer shall institute a medical surveillance program in accordance with subsections (2) and (3) of this section for all employees who are or may be exposed by the employer at or above the action level for more than 30 days in any consecutive 12 months;

(c) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

(d) The employer shall make available the required medical surveillance including multiple physician review under subsection (3)(c) without cost to employees and at a reasonable time and place.

(2) Biological monitoring.

(a) Blood lead and ZPP level sampling and analysis. The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered by subsection (1)(a) and (b) of this section on the following schedule:

(i) For each employee covered by subsection (1)(b) of this section, at least every 2 months for the first 6 months and every 6 months thereafter;

(ii) For each employee covered by subsection (1)(a) or (b) of this section whose last blood sampling and analysis indicated a blood lead level at or above 40 µg/dl, at least every two months. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/dl; and

(iii) For each employee who is removed from exposure to lead due to an elevated blood lead level at least monthly during the removal period.

(b) Follow-up blood sampling tests. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under WAC 296-155-17623 (1)(a), the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

(c) Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this WAC 296-155-176 shall have an accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 µg/dl, whichever is greater, and shall be conducted by a laboratory approved by OSHA.

(d) Employee notification.

(i) Within five working days after the receipt of biological monitoring results, the employer shall notify each employee in writing of their blood lead level; and

(ii) The employer shall notify each employee whose blood lead level exceeds 40 µg/dl that the standard requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds

the numerical criterion for medical removal under WAC 296-155-17623 (1)(a).

(3) Medical examinations and consultations.

(a) Frequency. The employer shall make available medical examinations and consultations to each employee covered by subsection (1)(b) of this section on the following schedule:

(i) At least annually for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 µg/dl;

(ii) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, that the employee is pregnant, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

(iii) As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

(b) Content. The content of medical examinations made available pursuant to subdivision (a)(ii) and (iii) of this subsection shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility. Medical examinations made available pursuant to subdivision (a)(i) of this subsection shall include the following elements:

(i) A detailed work history and a medical history, with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;

(ii) A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

(iii) A blood pressure measurement;

(iv) A blood sample and analysis which determines:

(A) Blood lead level;

(B) Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

(C) Zinc protoporphyrin;

(D) Blood urea nitrogen; and,

(E) Serum creatinine;

(v) A routine urinalysis with microscopic examination; and

(vi) Any laboratory or other test relevant to lead exposure which the examining physician deems necessary by sound medical practice.

(c) Multiple physician review mechanism.

(i) If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee by WAC 296-155-176, the employee may designate a second physician:

(A) To review any findings, determinations or recommendations of the initial physician; and

(B) To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

(ii) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to WAC 296-155-176. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

(A) The employee informing the employer that they intend to seek a second medical opinion; and

(B) The employee initiating steps to make an appointment with a second physician.

(iii) If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

(iv) If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

(A) To review any findings, determinations or recommendations of the prior physicians; and

(B) To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

(v) The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(d) Information provided to examining and consulting physicians.

(i) The employer shall provide an initial physician conducting a medical examination or consultation under WAC 296-155-176 with the following information:

(A) A copy of this regulation for lead including all Appendices;

(B) A description of the affected employee's duties as they relate to the employee's exposure;

(C) The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

(D) A description of any personal protective equipment used or to be used;

(E) Prior blood lead determinations; and

(F) All prior written medical opinions concerning the employee in the employer's possession or control.

(ii) The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under WAC 296-155-176 upon request either by the second or third physician, or by the employee.

(e) Written medical opinions.

(i) The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains only the following information:

(A) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

(B) Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

(C) Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and

(D) The results of the blood lead determinations.

(ii) The employer shall instruct each examining and consulting physician to:

(A) Not reveal either in the written opinion or orally, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

(B) Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.

(f) Alternate physician determination mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by subdivision (c) of this subsection so long as the alternate mechanism is as expeditious and protective as the requirements contained in this section.

(4) Chelation.

(a) The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.

(b) If therapeutic or diagnostic chelation is to be performed by any person in subdivision (a) of this subsection, the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17621, filed 10/29/93, effective 12/10/93.]

#### **WAC 296-155-17623 Medical removal protection.**

(1) Temporary medical removal and return of an employee.

(a) Temporary removal due to elevated blood lead level. The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to WAC 296-155-176 indicate that the employee's blood lead level is at or above 50 µg/dl; and

(b) Temporary removal due to a final medical determination.

(i) The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(ii) For the purposes of WAC 296-155-176, the phrase "final medical determination" means the written medical opinion on the employees' health status by the examining physician or, where relevant, the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of WAC 296-155-176.

(iii) Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement and act consistent with the recommendation.

(c) Return of the employee to former job status.

(i) The employer shall return an employee to their former job status:

(A) For an employee removed due to a blood lead level at or above 50 µg/dl when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 µg/dl;

(B) For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(ii) For the purposes of WAC 296-155-176, the requirement that an employer return an employee to their former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(d) Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(e) Employer options pending a final medical determination. Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of WAC 296-155-176, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

(i) Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

(ii) Return. The employer may return the employee to their former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions.

(A) If the initial removal, special protection, or limitation of the employee resulted from a final medical determination

which differed from the findings, determinations, or recommendations of the initial physician or;

(B) If the employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

(2) Medical removal protection benefits.

(a) Provision of medical removal protection benefits. The employer shall provide an employee up to eighteen (18) months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to WAC 296-155-176.

(b) Definition of medical removal protection benefits. For the purposes of WAC 296-155-176, the requirement that an employer provide medical removal protection benefits means that, as long as the job the employee was removed from continues, the employer shall maintain the total normal earnings, seniority and other employment rights and benefits of an employee, including the employee's right to their former job status as though the employee had not been medically removed from the employee's job or otherwise medically limited.

(c) Follow-up medical surveillance during the period of employee removal or limitation. During the period of time that an employee is medically removed from their job or otherwise medically limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to WAC 296-155-176.

(d) Workers' compensation claims. If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment-related expenses.

(e) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(f) Voluntary removal or restriction of an employee. Where an employer, although not required by WAC 296-155-176 to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by subdivisions (a) and (b) of this subsection.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17623, filed 10/29/93, effective 12/10/93.]

### **WAC 296-155-17625 Employee information and training.** (1) General.

(a) The employer shall communicate information concerning lead hazards according to the requirements of

WISHA's Hazard Communication Standard for the construction industry, chapter 296-800 WAC, including but not limited to the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training. In addition, employers shall comply with the following requirements:

(b) For all employees who are subject to exposure to lead at or above the action level on any day or who are subject to exposure to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the employer shall provide a training program in accordance with subsection (2) of this section and assure employee participation.

(c) The employer shall provide the training program as initial training prior to the time of job assignment or prior to the start up date for this requirement, whichever comes last.

(d) The employer shall also provide the training program at least annually for each employee who is subject to lead exposure at or above the action level on any day.

(2) Training program. The employer shall assure that each employee is trained in the following:

(a) The content of this standard and its appendices;

(b) The specific nature of the operations which could result in exposure to lead above the action level;

(c) The training requirements for respiratory protection as required by WAC 296-842-110, 296-842-19005, and 296-842-16005;

(d) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant);

(e) The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices described in Appendix B, WAC 296-155-17652;

(f) The contents of any compliance plan in effect;

(g) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and

(h) The employee's right of access to records under Part B, chapter 296-62 WAC and chapter 296-800 WAC.

(3) Access to information and training materials.

(a) The employer shall make readily available to all affected employees a copy of this standard and its appendices.

(b) The employer shall provide, upon request, all materials relating to the employee information and training program to affected employees and their designated representatives, and the director.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-20-055, § 296-155-17625, filed 10/3/05, effective 12/1/05; 05-03-093, § 296-155-17625, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 01-11-038, § 296-155-17625, filed 5/9/01, effective 9/1/01; 99-10-071, § 296-155-17625, filed 5/4/99, effective 9/1/99. Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17625, filed 10/29/93, effective 12/10/93.]

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**WAC 296-155-17627 Signs.** (1) General.

(a) The employer may use signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs required by this section.

(b) The employer shall assure that no statement appears on or near any sign required by this section which contradicts or detracts from the meaning of the required sign.

(2) Signs.

(a) The employer shall post the following warning signs in each work area where an employees exposure to lead is above the PEL.

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

(b) The employer shall assure that signs required by this section are illuminated and cleaned as necessary so that the legend is readily visible.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17627, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17629 Recordkeeping.** (1) Exposure assessment.

(a) The employer shall establish and maintain an accurate record of all monitoring and other data used in conducting employee exposure assessments as required in WAC 296-155-17609.

(b) Exposure monitoring records shall include:

(i) The date(s), number, duration, location and results of each of the samples taken if any, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(ii) A description of the sampling and analytical methods used and evidence of their accuracy;

(iii) The type of respiratory protective devices worn, if any;

(iv) Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

(v) The environmental variables that could affect the measurement of employee exposure.

(c) The employer shall maintain monitoring and other exposure assessment records in accordance with the provisions of part B, chapter 296-62 WAC.

(2) Medical surveillance.

(a) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by WAC 296-155-17621.

(b) This record shall include:

(i) The name, Social Security number, and description of the duties of the employee;

(ii) A copy of the physician's written opinions;

(iii) Results of any airborne exposure monitoring done on or for that employee and provided to the physician; and

(iv) Any employee medical complaints related to exposure to lead.

(c) The employer shall keep, or assure that the examining physician keeps, the following medical records:

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(i) A copy of the medical examination results including medical and work history required by WAC 296-155-17621;

(ii) A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;

(iii) A copy of the results of biological monitoring.

(d) The employer shall maintain or assure that the physician maintains medical records in accordance with the provisions of part B, chapter 296-62 WAC.

(3) Medical removals.

(a) The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to WAC 296-155-17623.

(b) Each record shall include:

(i) The name and social security number of the employee;

(ii) The date of each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to their former job status;

(iii) A brief explanation of how each removal was or is being accomplished; and

(iv) A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

(c) The employer shall maintain each medical removal record for at least the duration of an employee's employment.

(4) Objective data for exemption from requirement for initial monitoring.

(a) For purposes of WAC 296-155-176, objective data are information demonstrating that a particular product or material containing lead or a specific process, operation, or activity involving lead cannot release dust or fumes in concentrations at or above the action level under any expected conditions of use. Objective data can be obtained from an industry-wide study or from laboratory product test results from manufacturers of lead containing products or materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices and environmental conditions in the employer's current operations.

(b) The employer shall maintain the record of the objective data relied upon for at least 30 years.

(5) Availability. The employer shall make available upon request all records required to be maintained by this section to affected employees, former employees, and their designated representatives, and to the director for examination and copying.

(6) Transfer of records.

(a) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by this section.

(b) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by WAC 296-155-176 for the prescribed period, these records shall be transmitted to the director.

(c) At the expiration of the retention period for the records required to be maintained by WAC 296-155-176, the employer shall notify the director at least 3 months prior to

the disposal of such records and shall transmit those records to the director if requested within the period.

(d) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17629, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17631 Observation of monitoring.** (1)

Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to WAC 296-155-17609.

(2) Observation procedures.

(a) Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing and equipment, and shall require the observer to comply with all other applicable safety and health procedures.

(b) Without interfering with the monitoring, observers shall be entitled to:

(i) Receive an explanation of the measurement procedures;

(ii) Observe all steps related to the monitoring of lead performed at the place of exposure; and

(iii) Record the results obtained or receive copies of the results when returned by the laboratory.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17631, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17650 Appendix A to WAC 296-155-176—Substance data sheet for occupational exposure to lead.** The information contained in the appendices to WAC 296-155-176 is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

(1) Substance identification.

(a) Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

(b) Compounds covered by the standard: The word "lead" when used in this standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

(c) Uses: Exposure to lead occurs in several different occupations in the construction industry, including demolition or salvage of structures where lead or lead-containing materials are present; removal or encapsulation of lead-containing materials, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead; installation of products containing lead. In addition, there are construction related activities where exposure to lead may occur, including transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and maintenance operations associated with construction activities.

(d) Permissible exposure: The permissible exposure limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air ( $50 \mu\text{g}/\text{m}^3$ ), averaged over an 8-hour workday.

(e) Action level: The standard establishes an action level of 30 micrograms of lead per cubic meter of air ( $30 \mu\text{g}/\text{m}^3$ ), averaged over an 8-hour workday. The action level triggers several ancillary provisions of the standard such as exposure monitoring, medical surveillance, and training.

(2) Health hazard data.

(a) Ways in which lead enters your body. When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion. A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

(b) Effects of overexposure to lead.

(i) Short term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(ii) Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of

appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain. Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy. Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible. Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

(iii) Health protection goals of the standard. Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that a worker's blood lead level (BLL, also expressed as PbB) be maintained at or below forty micrograms per deciliter of whole blood ( $40 \mu\text{g}/\text{dl}$ ). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below  $30 \mu\text{g}/\text{dl}$  to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of your blood lead level (BLL) is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels are most often reported in units of milligrams (mg) or micrograms ( $\mu\text{g}$ ) of lead ( $1 \text{ mg} = 1000 \mu\text{g}$ ) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometime BLLs are expressed in the form of mg% or  $\mu\text{g}\%$ .

This is a shorthand notation for 100g, 100 ml, or dl. (References to BLL measurements in this standard are expressed in the form of  $\mu\text{g}/\text{dl}$ .)

BLL measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, your BLL is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

Once your blood lead level climbs above 40  $\mu\text{g}/\text{dl}$ , your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular BLL in a given person will cause a particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150  $\mu\text{g}/\text{dl}$ . Other studies have shown other forms of diseases in some workers with BLLs well below 80  $\mu\text{g}/\text{dl}$ . Your BLL is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated BLLs. The longer you have an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead-related impairments and diseases—both short term and long term—is to maintain your BLL below 40  $\mu\text{g}/\text{dl}$ . The provisions of the standard are designed with this end in mind.

Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You, as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing employee actions.

(iv) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead or your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases, your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place. The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if your employer selected the initial physician.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17650, filed 10/29/93, effective 12/10/93.]

**WAC 296-155-17652 Appendix B to WAC 296-155-176—Employee standard summary.** This appendix sum-

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marizes key provisions of the standard for lead in construction that you as a worker should become familiar with.

(1) Permissible exposure limit (PEL)—WAC 296-62-17607.

The standard sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air (50  $\mu\text{g}/\text{m}^3$ ), averaged over an 8-hour workday which is referred to as a time-weighted average (TWA). This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. However, since this is an 8-hour average, short exposures above the PEL are permitted so long as for each 8-hour work day your average exposure does not exceed this level. This standard, however, takes into account the fact that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this situation, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be 40  $\mu\text{g}/\text{m}^3$ .

(2) Exposure assessment—WAC 296-155-17609.

If lead is present in your workplace in any quantity, your employer is required to make an initial determination of whether any employee's exposure to lead exceeds the action level (30  $\mu\text{g}/\text{m}^3$  averaged over an 8-hour day). Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires your employer to monitor workers' exposures unless the employee has objective data which can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment until such time that conditions have changed and the determination is no longer valid.

Objective data may be compiled from various sources, e.g., insurance companies and trade associations and information from suppliers or exposure data collected from similar operations. Objective data may also comprise previously-collected sampling data including area monitoring. If it cannot be determined through using objective data that worker exposure is less than the action level, your employer must conduct monitoring or must rely on relevant previous personal sampling, if available. Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past 12 months, they may use these results, provided they are applicable to the same employee tasks and exposure conditions and meet the requirements for accuracy as specified in the standard. As with objective data, if such results are relied upon for the initial determination, your employer must establish and maintain a record as to the relevancy of such data to current job conditions.

If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indi-

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cate employee exposure to lead, this must also be considered as part of the initial determination. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirator, over the action level, your employer must set up an air monitoring program to determine the exposure level representative of each employee exposed to lead at your workplace. In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but they must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represent full shift exposure. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. Sampling performed in the past 12 months may be used to determine exposures above the action level if such sampling was conducted during work activities essentially similar to present work conditions.

The standard lists certain tasks which may likely result in exposures to lead in excess of the PEL and, in some cases, exposures in excess of 50 times the PEL. If you are performing any of these tasks, your employer must provide you with appropriate respiratory protection, protective clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until such time that an exposure assessment is conducted which demonstrates that your exposure level is below the PEL.

If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing within 5 working days of the air monitoring results which represent your exposure. If the results indicate that your exposure exceeds the PEL (without regard to your use of a respirator), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that has been taken or will be taken to reduce your exposure.

Your exposure must be rechecked by monitoring, at least every six months if your exposure is at or over the action level but below the PEL. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least 7 days apart, are at or below the action level. Air monitoring must be repeated every 3 months if you are exposed over the PEL. Your employer must continue monitoring for you at this frequency until 2 consecutive measurements, taken at least 7 days apart, are below the PEL but above the action level, at which time your employer must repeat monitoring of your exposure every six months and may discontinue monitoring only after your exposure drops to or below the action level. However, whenever there is a change of equipment, process, control, or personnel or a new type of job is added at your workplace which may result in new or additional exposure to lead, your employer must perform additional monitoring.

### (3) Methods of compliance—WAC 296-155-17611.

Your employer is required to assure that no employee is exposed to lead in excess of the PEL as an 8-hour TWA. The standard for lead in construction requires employers to institute engineering and work practice controls including administrative controls to the extent feasible to reduce employee exposure to lead. Where such controls are feasible but not adequate to reduce exposures below the PEL they must be used nonetheless to reduce exposures to the lowest level that

can be accomplished by these means and then supplemented with appropriate respiratory protection.

Your employer is required to develop and implement a written compliance program prior to the commencement of any job where employee exposures may reach the PEL as an 8-hour TWA. The standard identifies the various elements that must be included in the plan. For example, employers are required to include a description of operations in which lead is emitted, detailing other relevant information about the operation such as the type of equipment used, the type of material involved, employee job responsibilities, operating procedures and maintenance practices. In addition, your employer's compliance plan must specify the means that will be used to achieve compliance and, where engineering controls are required, include any engineering plans or studies that have been used to select the control methods. If administrative controls involving job rotation are used to reduce employee exposure to lead, the job rotation schedule must be included in the compliance plan. The plan must also detail the type of protective clothing and equipment, including respirator, housekeeping and hygiene practices that will be used to protect you from the adverse effects of exposure to lead.

The written compliance program must be made available, upon request, to affected employees and their designated representatives, and the director.

Finally, the plan must be reviewed and updated at least every 6 months to assure it reflects the current status in exposure control.

### (4) Respiratory protection—WAC 296-155-17613.

Your employer is required to select respirator from the types listed in Table I of the Respiratory Protection section of the standard (see WAC 296-155-17613). Any respirator chosen must be certified by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 42 CFR part 84. This respirator selection table will enable your employer to choose a type of respirator that will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your workplace. For example, a powered air-purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge, or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time. The standard provides that you can obtain a PAPR upon request.

Your employer must also start a Respiratory Protection Program. This program must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirator.

Your employer must ensure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical to your protection from airborne lead. Obtaining a proper fit on each employee may require your employer to make available several different types of respirator masks. To ensure that your respirator fits properly and that facepiece leakage is minimal, your employer must give you either a

qualitative or quantitative fit test as specified in WAC 296-842-15005.

(5) Protective work clothing and equipment—WAC 296-155-17615.

If you are exposed to lead above the PEL as an 8-hour TWA, without regard to your use of a respirator, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200  $\mu\text{g}/\text{m}^3$ . Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. In addition, your employer is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment.

The standard requires that your employer assure that you follow good work practices when you are working in areas where your exposure to lead may exceed the PEL. With respect to protective clothing and equipment, where appropriate, the following procedures should be observed prior to beginning work:

- ◆ Change into work clothing and shoe covers in the clean section of the designated changing areas;
- ◆ Use work garments of appropriate protective gear, including respirator before entering the work area; and
- ◆ Store any clothing not worn under protective clothing in the designated changing area.

Workers should follow these procedures upon leaving the work area:

- ◆ HEPA vacuum heavily contaminated protective work clothing while it is still being worn. At no time may lead be removed from protective clothing by any means which result in uncontrolled dispersal of lead into the air;
- ◆ Remove shoe covers and leave them in the work area;
- ◆ Remove protective clothing and gear in the dirty area of the designated changing area. Remove protective coveralls by carefully rolling down the garment to reduce exposure to dust.
- ◆ Remove respirator last; and
- ◆ Wash hands and face.

Workers should follow these procedures upon finishing work for the day (in addition to procedures described above):

- ◆ Where applicable, place disposal coveralls and shoe covers with the abatement waste;
- ◆ Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room.
- ◆ Clean protective gear, including respirator, according to standard procedures;
- ◆ Wash hands and face again.

If showers are available, take a shower and wash hair. If shower facilities are not available at the work site, shower immediately at home and wash hair.

(6) Housekeeping—WAC 296-155-17617.

Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is generally prohibited unless removal with compressed air is done in conjunction with ventilation systems designed to contain dispersal of the lead dust. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used equipped with a special filter called a high-efficiency particulate air (HEPA) filter and emptied in a manner which minimizes the reentry of lead into the workplace.

(7) Hygiene facilities and practices—WAC 296-155-17619.

The standard requires that hand washing facilities be provided where occupational exposure to lead occurs. In addition, change areas, showers (where feasible), and lunchrooms or eating areas are to be made available to workers exposed to lead above the PEL. Your employer must assure that except in these facilities, food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, where airborne exposures are above the PEL. Change rooms provided by your employer must be equipped with separate storage facilities for your protective clothing and equipment and street clothes to avoid cross-contamination. After showering, no required protective clothing or equipment worn during the shift may be worn home. It is important that contaminated clothing or equipment be removed in change areas and not be worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc.

Lunchrooms or eating areas may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes, or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

(8) Medical surveillance—WAC 296-155-17621.

The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have affectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers:

- ◆ Who have high body burdens of lead acquired over past years,
- ◆ Who have additional uncontrolled sources of nonoccupational lead exposure,
- ◆ Who exhibit unusual variations in lead absorption rates, or
- ◆ Who have specific nonwork related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia).

In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability—regardless of whether you are a man or woman.

All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts—periodic biological monitoring and medical examinations. Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Full medical surveillance must be made available to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 µg/dl. Initial medical surveillance consisting of blood sampling and analysis for lead and zinc protoporphyrin must be provided to all employees exposed at any time (1 day) above the action level.

Biological monitoring under the standard must be provided at least every 2 months for the first 6 months and every 6 months thereafter until your blood lead level is below 40 µg/dl. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an adverse metabolic effect of lead on your body and is therefore an indicator of lead toxicity.

If your BLL exceeds 40 µg/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive BLLs indicate a blood lead level below 40 µg/dl. Each time your BLL is determined to be over 40 µg/dl, your employer must notify you of this in writing within five working days of their receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your BLL exceeds 50 µg/dl. (See Discussion of medical removal protection—WAC 296-155-17623.) Anytime your BLL exceeds 50 µg/dl your employer must make available to you within two weeks of receipt of these test results a second follow-up BLL test to confirm your BLL. If the two tests both exceed 50 µg/dl, and you are temporarily removed, then your employer must make successive BLL tests available to you on a monthly basis during the period of your removal.

Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 µg/dl at any time during the preceding year and you are being exposed above the airborne action level of 30 µg/m<sup>3</sup> for 30 or more days per year. The initial examination will provide information to establish a baseline to which subsequent data can be compared.

An initial medical examination to consist of blood sampling and analysis for lead and zinc protoporphyrin must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level at any time. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See subsection (9), below.)

The standard specifies the minimum content of preassignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Preassignment and annual medical examinations must include:

- ◆ A detailed work history and medical history;
- ◆ A thorough physical examination, including an evaluation of your pulmonary status if you will be required to use a respirator;
- ◆ A blood pressure measurement; and
- ◆ A series of laboratory tests designed to check your blood chemistry and your kidney function.

In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which will give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you are dissatisfied with an examination by a physician chosen by your employer, you can select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute. Generally your employer will choose the physician who conducts medical surveillance under the lead standard—unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

The standard requires your employer to provide certain information to a physician to aid in their examination of you. This information includes:

- ◆ The standard and its appendices,
- ◆ A description of your duties as they relate to occupational lead exposure,

- ◆ Your exposure level or anticipated exposure level,
- ◆ A description of any personal protective equipment you wear,
- ◆ Prior blood lead level results, and
- ◆ Prior written medical opinions concerning you that the employer has.

After a medical examination or consultation the physician must prepare a written report which must contain:

- ◆ The physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead,
- ◆ Any recommended special protective measures to be provided to you,
- ◆ Any blood lead level determinations, and
- ◆ Any recommended limitation on your use of respirator.

This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

The medical surveillance program of the lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker who learns of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that WISHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for WISHA to make you aware of this.

The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA, (Ca Na<sub>2</sub> EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelat-

ing or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be "safe." It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involved giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

#### (9) Medical removal protection—WAC 296-155-17623.

Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirator, have failed to provide the protection you need. MRP involves the temporary removal of a worker from their regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. For up to 18 months, or for as long as the job the employee was removed from lasts, protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires.

You may also be removed from exposure even if your blood lead level is below 50 µ/dl if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad

discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or they may be temporarily laid off if no other alternative is feasible.

In all of these situation, MRP benefits must be provided during the period of removal—i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow up medical surveillance, you may lose your eligibility for MRP benefits.

When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirator cannot be used as a substitute. Respirator may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

(10) Employee information and training—WAC 296-155-17625.

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The program must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the stan-

dard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter unless further exposure above the action level will not occur.

(11) Signs—WAC 296-155-17627.

The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

These signs are to be posted and maintained in a manner which assures that the legend is readily visible.

(12) Recordkeeping—WAC 296-155-17629.

Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytical techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Such records are to be retained for at least 30 years. Your employer is also required to keep all records of biological monitoring and medical examination results. These records must include the names of the employees, the physician's written opinion, and a copy of the results of the examination. Medical records must be preserved and maintained for the duration of employment plus 30 years. However, if the employee's duration of employment is less than one year, the employer need not retain that employee's medical records beyond the period of employment if they are provided to the employee upon termination of employment.

Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and Social Security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than BLL's must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

(13) Observation of monitoring—WAC 296-155-17631.

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the

results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

(14) Startup date—WAC 296-155-17635.

Employer obligations under the standard begin as of that date with full implementation of engineering controls as soon as possible but no later than within 4 months, and all other provisions completed as soon as possible, but no later than within 2 months from the effective date.

(15) For additional information.

(a) A copy of the standard for lead in construction can be obtained free of charge by calling or writing to the department of labor and industries, Post Office Box 44620, Mailstop 44620, Olympia, Washington 98504-4620: Telephone (360) 956-5527.

(b) Additional information about the standard, its enforcement, and your employer's compliance can be obtained from the nearest office listed in your telephone directory under the state of Washington, department of labor and industries.

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**WAC 296-155-17654 Appendix C to WAC 296-155-176—Medical surveillance guidelines. (1) Introduction.**

The primary purpose of the Washington Industrial Safety and Health Act of 1973 is to assure, so far as possible, safe and healthful working conditions for every working man and woman. The occupational health standard for lead in construction is designed to protect workers exposed to inorganic lead including metallic lead, all inorganic lead compounds and organic lead soaps.

Under this standard occupational exposure to inorganic lead is to be limited to 50 µg/m<sup>3</sup> (micrograms per cubic meter) based on an 8 hour time-weighted average (TWA). This permissible exposure limit (PEL) must be achieved through a combination of engineering, work practice and administrative controls to the extent feasible. Where these controls are in place but are found not to reduce employee exposures to or below the PEL, they must be used nonetheless, and supplemented with respirators to meet the 50 µg/m<sup>3</sup> exposure limit.

The standard also provides for a program of biological monitoring for employees exposed to lead above the action level at any time, and additional medical surveillance for all employees exposed to levels of inorganic lead above 30 µg/m<sup>3</sup> (TWA) for more than 30 days per year and whose BLL exceeds 40 µg/dl.

The purpose of this document is to outline the medical surveillance provisions of the standard for inorganic lead in construction, and to provide further information to the physician regarding the examination and evaluation of workers exposed to inorganic lead.

Subsection (2) provides a detailed description of the monitoring procedure including the required frequency of blood testing for exposed workers, provisions for medical removal protection (MRP), the recommended right of the employee to a second medical opinion, and notification and recordkeeping requirements of the employer. A discussion of the requirements for respirator use and respirator monitoring and WISHA's position on prophylactic chelation therapy are also included in this subsection.

Subsection (3) discusses the toxic effects and clinical manifestations of lead poisoning and effects of lead intoxication on enzymatic pathways in heme synthesis. The adverse effects on both male and female reproductive capacity and on the fetus are also discussed.

Subsection (4) outlines the recommended medical evaluation of the worker exposed to inorganic lead, including details of the medical history, physical examination, and recommended laboratory tests, which are based on the toxic effects of lead as discussed in subsection (3).

Subsection (5) provides detailed information concerning the laboratory tests available for the monitoring of exposed workers. Included also is a discussion of the relative value of each test and the limitations and precautions which are necessary in the interpretation of the laboratory results.

(2) Medical surveillance and monitoring requirements for workers exposed to inorganic lead.

Under the standard for inorganic lead in the construction industry, initial medical surveillance consisting of biological monitoring to include blood lead and ZPP level determination shall be provided to employees exposed to lead at or above the action level on any one day. In addition, a program of biological monitoring is to be made available to all employees exposed above the action level at any time and additional medical surveillance is to be made available to all employees exposed to lead above 30 µg/m<sup>3</sup> TWA for more than 30 days each year and whose BLL exceeds 40 µg/dl. This program consists of periodic blood sampling and medical evaluation to be performed on a schedule which is defined by previous laboratory results, worker complaints or concerns, and the clinical assessment of the examining physician.

Under this program, the blood lead level (BLL) of all employees who are exposed to lead above 30 µg/m<sup>3</sup> for more than 30 days per year or whose blood lead is above 40 µg/dl but exposed for no more than 30 days per year is to be determined at least every two months for the first six months of exposure and every six months thereafter. The frequency is increased to every two months for employees whose last blood lead level was 40 µg/dl or above. For employees who are removed from exposure to lead due to an elevated blood lead, a new blood lead level must be measured monthly. A zinc protoporphyrin (ZPP) measurement is strongly recommended on each occasion that a blood lead level measurement is made.

An annual medical examination and consultation performed under the guidelines discussed in subsection (4) is to be made available to each employee exposed above 30 µg/m<sup>3</sup> for more than 30 days per year for whom a blood test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 µg/dl. Also, an examination

is to be given to all employees prior to their assignment to an area in which airborne lead concentrations reach or exceed the  $30 \mu\text{g}/\text{m}^3$  for more than 30 days per year. In addition, a medical examination must be provided as soon as possible after notification by an employee that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice regarding lead exposure and the ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during respirator use. An examination is also to be made available to each employee removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited or specially protected pursuant to medical recommendations.

Results of biological monitoring or the recommendations of an examining physician may necessitate removal of an employee from further lead exposure pursuant to the standard's medical removal protection (MRP) program. The object of the MRP program is to provide temporary medical removal to workers either with substantially elevated blood lead levels or otherwise at risk of sustaining material health impairment from continued substantial exposure to lead.

Under the standard's ultimate worker removal criteria, a worker is to be removed from any work having an eight hour TWA exposure to lead of  $30 \mu\text{g}/\text{m}^3$  when their blood lead level reaches  $50 \mu\text{g}/\text{dl}$  and is confirmed by a second follow-up blood lead level performed within two weeks after the employer receives the results of the first blood sampling test. Return of the employee to their job status depends on a worker's blood lead level declining to  $40 \mu\text{g}/\text{dl}$ .

As part of the standard, the employer is required to notify in writing each employee whose blood lead level exceeds  $40 \mu\text{g}/\text{dl}$ . In addition each such employee is to be informed that the standard requires medical removal with MRP benefits, discussed below, when an employee's blood lead level exceeds the above defined limit.

In addition to the above blood lead level criterion, temporary worker removal may also take place as a result of medical determinations and recommendations. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes a medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above  $30 \mu\text{g}/\text{m}^3$ . Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations.

Recommendations may be more stringent than the specific provisions of the standard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to raise children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when,

in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to their former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that special measures are no longer needed.

During the period of any form of special protection or removal, the employer must maintain the worker's earnings, seniority, and other employment rights and benefits (as though the worker had not been removed) for a period of up to 18 months or for as long as the job the employee was removed from lasts if less than 18 months. This economic protection will maximize meaningful worker participation in the medical surveillance program, and is appropriate as part of the employer's overall obligation to provide a safe and healthful workplace. The provisions of MRP benefits during the employee's removal period may, however, be conditioned upon participation in medical surveillance.

The lead standard provides for a multiple physician review in cases where the employee wishes a second opinion concerning potential lead poisoning or toxicity. If an employee wishes a second opinion, they can make an appointment with a physician of their choice. This second physician will review the findings, recommendations or determinations of the first physician and conduct any examinations, consultations or tests deemed necessary in an attempt to make a final medical determination. If the first and second physicians do not agree in their assessment they must try to resolve their differences. If they cannot reach an agreement then they must designate a third physician to resolve the dispute.

The employer must provide examining and consulting physicians with the following specific information: A copy of the lead regulations and all appendices, a description of the employee's duties as related to exposure, the exposure level or anticipated level to lead and any other toxic substances (if applicable), a description of personal protective equipment used, blood lead levels, and all prior written medical opinions regarding the employee in the employer's possession or control. The employer must also obtain from the physician and provide the employee with a written medical opinion containing blood lead levels, the physician's opinion as to whether the employee is at risk of material impairment to health, any recommended protective measures for the employee if further exposure is permitted, as well as any recommended limitations upon an employee's use of respirators.

Employers must instruct each physician not to reveal to the employer in writing or in any other way their findings, laboratory results, or diagnoses which are felt to be unrelated to occupational lead exposure. They must also instruct each physician to advise the employee of any occupationally or non-occupationally related medical condition requiring further treatment or evaluation.

The standard provides for the use of respirators where engineering and other primary controls are not effective. However, the use of respirator protection shall not be used in lieu of temporary medical removal due to elevated blood lead levels or findings that an employee is at risk of material health impairment. This is based on the numerous inadequacies of respirators including skin rash where the facepiece

makes contact with the skin, unacceptable stress to breathing in some workers with underlying cardiopulmonary impairment, difficulty in providing adequate fit, the tendency for respirators to create additional hazards by interfering with vision, hearing, and mobility, and the difficulties of assuring the maximum effectiveness of a complicated work practice program involving respirators. Respirators do, however, serve a useful function where engineering and work practice controls are inadequate by providing supplementary, interim, or short-term protection, provided they are properly selected for the environment in which the employee will be working, properly fitted to the employee, maintained and cleaned periodically, and worn by the employee when required.

In its standard on occupational exposure to inorganic lead in the construction industry, WISHA has prohibited prophylactic chelation. Diagnostic and therapeutic chelation are permitted only under the supervision of a licensed physician with appropriate medical monitoring in an acceptable clinical setting. The decision to initiate chelation therapy must be made on an individual basis and take into account the severity of symptoms felt to be a result of lead toxicity along with blood lead levels, ZPP levels, and other laboratory tests as appropriate. EDTA and penicillamine which are the primary chelating agents used in the therapy of occupational lead poisoning have significant potential side effects and their use must be justified on the basis of expected benefits to the worker. Unless frank and severe symptoms are present, therapeutic chelation is not recommended, given the opportunity to remove a worker from exposure and allow the body to naturally excrete accumulated lead. As a diagnostic aid, the chelation mobilization test using CA-EDTA has limited applicability. According to some investigators, the test can differentiate between lead-induced and other nephropathies. The test may also provide an estimation of the mobile fraction of the total body lead burden.

Employers are required to assure that accurate records are maintained on exposure assessment, including environmental monitoring, medical surveillance, and medical removal for each employee. Exposure assessment records must be kept for at least 30 years. Medical surveillance records must be kept for the duration of employment plus 30 years except in cases where the employment was less than one year. If duration of employment is less than one year, the employer need not retain this record beyond the term of employment if the record is provided to the employee upon termination of employment. Medical removal records also must be maintained for the duration of employment. All records required under the standard must be made available upon request to the director. Employers must also make environmental and biological monitoring and medical removal records available to affected employees and to former employees or their authorized employee representatives. Employees or their specifically designated representatives have access to their entire medical surveillance records.

In addition, the standard requires that the employer inform all workers exposed to lead at or above  $30 \mu\text{g}/\text{m}^3$  of the provisions of the standard and all its appendices, the purpose and description of medical surveillance and provisions for medical removal protection if temporary removal is required. An understanding of the potential health effects of lead exposure by all exposed employees along with full

understanding of their rights under the lead standard is essential for an effective monitoring program.

(3) Adverse health effects of inorganic lead.

Although the toxicity of lead has been known for 2,000 years, the knowledge of the complex relationship between lead exposure and human response is still being refined. Significant research into the toxic properties of lead continues throughout the world, and it should be anticipated that our understanding of thresholds of effects and margins of safety will be improved in future years. The provisions of the lead standard are founded on two prime medical judgments: First, the prevention of adverse health effects from exposure to lead throughout a working lifetime requires that worker blood lead levels be maintained at or below  $40 \mu\text{g}/\text{dl}$  and second, the blood lead levels of workers, male or female, who intend to parent in the near future should be maintained below  $30 \mu\text{g}/\text{dl}$  to minimize adverse reproductive health effects to the parents and developing fetus. The adverse effects of lead on reproduction are being actively researched and WISHA encourages the physician to remain abreast of recent developments in the area to best advise pregnant workers or workers planning to conceive children.

The spectrum of health effects caused by lead exposure can be subdivided into five developmental stages: Normal, physiological changes of uncertain significance, pathophysiological changes, overt symptoms (morbidity), and mortality. Within this process there are no sharp distinctions, but rather a continuum of effects. Boundaries between categories overlap due to the wide variation of individual responses and exposures in the working population. WISHA's development of the lead standard focused on pathophysiological changes as well as later stages of disease.

(a) Heme synthesis inhibition. The earliest demonstrated effect of lead involves its ability to inhibit at least two enzymes of the heme synthesis pathway at very low blood levels. Inhibition of delta aminolevulinic acid dehydrase (ALA-D) which catalyzes the conversion of delta-aminolevulinic acid (ALA) to protoporphyrin is observed at a blood lead level below  $20 \mu\text{g}/\text{dl}$ . At a blood lead level of  $40 \mu\text{g}/\text{dl}$ , more than 20% of the population would have 70% inhibition of ALA-D. There is an exponential increase in ALA excretion at blood lead levels greater than  $40 \mu\text{g}/\text{dl}$ .

Another enzyme, ferrochelatase, is also inhibited at low blood lead levels. Inhibition of ferrochelatase leads to increased free erythrocyte protoporphyrin (FEP) in the blood which can then bind to zinc to yield zinc protoporphyrin. At a blood lead level of  $50 \mu\text{g}/\text{dl}$  or greater, nearly 100% of the population will have an increase in FEP. There is also an exponential relationship between blood lead levels greater than  $40 \mu\text{g}/\text{dl}$  and the associated ZPP level, which has led to the development of the ZPP screening test for lead exposure.

While the significance of these effects is subject to debate, it is WISHA's position that these enzyme disturbances are early stages of a disease process which may eventually result in the clinical symptoms of lead poisoning. Whether or not the effects do progress to the later stages of clinical disease, disruption of these enzyme processes over a working lifetime is considered to be a material impairment of health.

One of the eventual results of lead-induced inhibition of enzymes in the heme synthesis pathway is anemia which can be asymptomatic if mild but associated with a wide array of symptoms including dizziness, fatigue, and tachycardia when more severe. Studies have indicated that lead levels as low as 50 µg/dl can be associated with a definite decreased hemoglobin, although most cases of lead-induced anemia, as well as shortened red-cell survival times, occur at lead levels exceeding 80 µg/dl. Inhibited hemoglobin synthesis is more common in chronic cases whereas shortened erythrocyte life span is more common in acute cases.

In lead-induced anemias, there is usually a reticulocytosis along with the presence of basophilic stippling, and ringed sideroblasts, although none of the above are pathognomonic for lead-induced anemia.

(b) Neurological effects. Inorganic lead has been found to have toxic effects on both the central and peripheral nervous systems. The earliest stages of lead-induced central nervous system effects first manifest themselves in the form of behavioral disturbances and central nervous system symptoms including irritability, restlessness, insomnia and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. With more severe exposure, symptoms can progress to drowsiness, stupor, hallucinations, delirium, convulsions and coma.

The most severe and acute form of lead poisoning which usually follows ingestion or inhalation of large amounts of lead is acute encephalopathy which may arise precipitously with the onset of intractable seizures, coma, cardiorespiratory arrest, and death within 48 hours.

While there is disagreement about what exposure levels are needed to produce the earliest symptoms, most experts agree that symptoms definitely can occur at blood lead levels of 60 µg/dl whole blood and therefore recommend a 40 µg/dl maximum. The central nervous system effects frequently are not reversible following discontinued exposure or chelation therapy and when improvement does occur, it is almost always only partial.

The peripheral neuropathy resulting from lead exposure characteristically involves only motor function with minimal sensory damage and has a marked predilection for the extensor muscles of the most active extremity. The peripheral neuropathy can occur with varying degrees of severity. The earliest and mildest form which can be detected in workers with blood lead levels as low as 50 µg/dl is manifested by slowing of motor nerve conduction velocity often without clinical symptoms. With progression of the neuropathy there is development of painless extensor muscle weakness usually involving the extensor muscles of the fingers and hand in the most active upper extremity, followed in severe cases by wrist drop or, much less commonly, foot drop.

In addition to slowing of nerve conduction, electromyographical studies in patients with blood lead levels greater than 50 µg/dl have demonstrated a decrease in the number of acting motor unit potentials, an increase in the duration of motor unit potentials, and spontaneous pathological activity including fibrillations and fasciculations. Whether these effects occur at levels of 40 µg/dl is undetermined.

While the peripheral neuropathies can occasionally be reversed with therapy, again such recovery is not assured par-

ticularly in the more severe neuropathies and often improvement is only partial. The lack of reversibility is felt to be due in part to segmental demyelination.

(c) Gastrointestinal. Lead may also affect the gastrointestinal system producing abdominal colic or diffuse abdominal pain, constipation, obstipation, diarrhea, anorexia, nausea and vomiting. Lead colic rarely develops at blood lead levels below 80 µg/dl.

(d) Renal. Renal toxicity represents one of the most serious health effects of lead poisoning. In the early stages of disease nuclear inclusion bodies can frequently be identified in proximal renal tubular cells. Renal function remains normal and the changes in this stage are probably reversible. With more advanced disease there is progressive interstitial fibrosis and impaired renal function. Eventually extensive interstitial fibrosis ensues with sclerotic glomeruli and dilated and atrophied proximal tubules; all represent end stage kidney disease. Azotemia can be progressive, eventually resulting in frank uremia necessitating dialysis. There is occasionally associated hypertension and hyperuricemia with or without gout.

Early kidney disease is difficult to detect. The urinalysis is normal in early lead nephropathy and the blood urea nitrogen and serum creatinine increase only when two-thirds of kidney function is lost. Measurement of creatinine clearance can often detect earlier disease as can other methods of measurement of glomerular filtration rate. An abnormal Ca-EDTA mobilization test has been used to differentiate between lead-induced and other nephropathies, but this procedure is not widely accepted. A form of Fanconi syndrome with aminoaciduria, glycosuria, and hyperphosphaturia indicating severe injury to the proximal renal tubules is occasionally seen in children.

(e) Reproductive effects. Exposure to lead can have serious effects on reproductive function in both males and females. In male workers exposed to lead there can be a decrease in sexual drive, impotence, decreased ability to produce healthy sperm, and sterility. Malformed sperm (teratospermia), decreased number of sperm (hypospermia), and sperm with decreased motility (asthenospermia) can all occur. Teratospermia has been noted at mean blood lead levels of 53 µg/dl and hypospermia and asthenospermia at 41 µg/dl. Furthermore, there appears to be a dose-response relationship for teratospermia in lead exposed workers.

Women exposed to lead may experience menstrual disturbances including dysmenorrhea, menorrhagia and amenorrhea. Following exposure to lead, women have a higher frequency of sterility, premature births, spontaneous miscarriages, and stillbirths.

Germ cells can be affected by lead and cause genetic damage in the egg or sperm cells before conception and result in failure to implant, miscarriage, stillbirth, or birth defects.

Infants of mothers with lead poisoning have a higher mortality during the first year and suffer from lowered birth weights, slower growth, and nervous system disorders.

Lead can pass through the placental barrier and lead levels in the mother's blood are comparable to concentrations of lead in the umbilical cord at birth. Transplacental passage becomes detectable at 12-14 weeks of gestation and increases until birth.

There is little direct data on damage to the fetus from exposure to lead but it is generally assumed that the fetus and newborn would be at least as susceptible to neurological damage as young children. Blood lead levels of 50-60 µg/dl in children can cause significant neurobehavioral impairments and there is evidence of hyperactivity at blood levels as low as 25 µg/dl. Given the overall body of literature concerning the adverse health effects of lead in children, WISHA feels that the blood lead level in children should be maintained below 30 µg/dl with a population mean of 15 µg/dl. Blood lead levels in the fetus and newborn likewise should not exceed 30 µg/dl.

Because of lead's ability to pass through the placental barrier and also because of the demonstrated adverse effects of lead on reproductive function in both the male and female as well as the risk of genetic damage of lead on both the ovum and sperm, WISHA recommends a 30 µg/dl maximum permissible blood lead level in both males and females who wish to bear children.

(f) Other toxic effects. Debate and research continue on the effects of lead on the human body. Hypertension has frequently been noted in occupationally exposed individuals although it is difficult to assess whether this is due to lead's adverse effects on the kidney or if some other mechanism is involved. Vascular and electrocardiographic changes have been detected but have not been well characterized. Lead is thought to impair thyroid function and interfere with the pituitary-adrenal axis, but again these effects have not been well defined.

#### (4) Medical evaluation.

The most important principle in evaluating a worker for any occupational disease including lead poisoning is a high index of suspicion on the part of the examining physician. As discussed in section (3), lead can affect numerous organ systems and produce a wide array of signs and symptoms, most of which are non-specific and subtle in nature at least in the early stages of disease. Unless serious concern for lead toxicity is present, many of the early clues to diagnosis may easily be overlooked.

The crucial initial step in the medical evaluation is recognizing that a worker's employment can result in exposure to lead. The worker will frequently be able to define exposures to lead and lead containing materials but often will not volunteer this information unless specifically asked. In other situations the worker may not know of any exposures to lead but the suspicion might be raised on the part of the physician because of the industry or occupation of the worker. Potential occupational exposure to lead and its compounds occur in many occupations in the construction industry, including demolition and salvaging operations, removal or encapsulation of materials containing lead, construction, alteration, repair or renovation of structures containing lead, transportation, disposal, storage or containment of lead or lead-containing materials on construction sites, and maintenance operations associated with construction activities.

Once the possibility for lead exposure is raised, the focus can then be directed toward eliciting information from the medical history, physical exam, and finally from laboratory data to evaluate the worker for potential lead toxicity.

A complete and detailed work history is important in the initial evaluation. A listing of all previous employment with information on job description, exposure to fumes or dust, known exposures to lead or other toxic substances, a description of any personal protective equipment used, and previous medical surveillance should all be included in the worker's record. Where exposure to lead is suspected, information concerning on-the-job personal hygiene, smoking or eating habits in work areas, laundry procedures, and use of any protective clothing or respiratory protection equipment should be noted. A complete work history is essential in the medical evaluation of a worker with suspected lead toxicity, especially when long term effects such as neurotoxicity and nephrotoxicity are considered.

The medical history is also of fundamental importance and should include a listing of all past and current medical conditions, current medications including proprietary drug intake, previous surgeries and hospitalizations, allergies, smoking history, alcohol consumption, and also nonoccupational lead exposures such as hobbies (hunting, riflery). Also known childhood exposures should be elicited. Any previous history of hematological, neurological, gastrointestinal, renal, psychological, gynecological, genetic, or reproductive problems should be specifically noted.

A careful and complete review of systems must be performed to assess both recognized complaints and subtle or slowly acquired symptoms which the worker might not appreciate as being significant. The review of symptoms should include the following:

- ◆ General—weight loss, fatigue, decreased appetite.
- ◆ Head, eyes, ears, nose, throat (HEENT)—headaches, visual disturbances or decreased visual acuity, hearing deficits or tinnitus, pigmentation of the oral mucosa, or metallic taste in mouth.
- ◆ Cardio-pulmonary—shortness of breath, cough, chest pains, palpitations, or orthopnea.
- ◆ Gastrointestinal—nausea, vomiting, heartburn, abdominal pain, constipation or diarrhea.
- ◆ Neurologic—irritability, insomnia, weakness (fatigue), dizziness, loss of memory, confusion, hallucinations, incoordination, ataxia, decreased strength in hands or feet, disturbances in gait, difficulty in climbing stairs, or seizures.
- ◆ Hematologic—pallor, easy fatigability, abnormal blood loss, melena.
- ◆ Reproductive (male and female and spouse where relevant)—history of infertility, impotence, loss of libido, abnormal menstrual periods, history of miscarriages, stillbirths, or children with birth defects.
- ◆ Musculo-skeletal—muscle and joint pains.

The physical examination should emphasize the neurological, gastrointestinal, and cardiovascular systems. The worker's weight and blood pressure should be recorded and the oral mucosa checked for pigmentation characteristic of a possible Burtonian or lead line on the gingiva. It should be noted, however, that the lead line may not be present even in severe lead poisoning if good oral hygiene is practiced.

The presence of pallor on skin examination may indicate an anemia which, if severe, might also be associated with a tachycardia. If an anemia is suspected, an active search for blood loss should be undertaken including potential blood loss through the gastrointestinal tract.

A complete neurological examination should include an adequate mental status evaluation including a search for behavioral and psychological disturbances, memory testing, evaluation for irritability, insomnia, hallucinations, and mental clouding. Gait and coordination should be examined along with close observation for tremor. A detailed evaluation of peripheral nerve function including careful sensory and motor function testing is warranted. Strength testing particularly of extensor muscle groups of all extremities is of fundamental importance.

Cranial nerve evaluation should also be included in the routine examination.

The abdominal examination should include auscultation for bowel sounds and abdominal bruits and palpation for organomegaly, masses, and diffuse abdominal tenderness.

Cardiovascular examination should evaluate possible early signs of congestive heart failure. Pulmonary status should be addressed particularly if respirator protection is contemplated.

As part of the medical evaluation, the lead standard requires the following laboratory studies:

- ◆ Blood lead level.
- ◆ Hemoglobin and hematocrit determinations, red cell indices, and examination of the peripheral blood smear to evaluate red blood cell morphology.
- ◆ Blood urea nitrogen.
- ◆ Serum creatinine.
- ◆ Routine urinalysis with microscopic examination.
- ◆ A zinc protoporphyrin level.

In addition to the above, the physician is authorized to order any further laboratory or other tests which they deem necessary in accordance with sound medical practice. The evaluation must also include pregnancy testing or laboratory evaluation of male fertility if requested by the employee. Additional tests which are probably not warranted on a routine basis but may be appropriate when blood lead and ZPP levels are equivocal include delta aminolevulinic acid and coproporphyrin concentrations in the urine, and dark-field illumination for detection of basophilic stippling in red blood cells.

If an anemia is detected further studies including a careful examination of the peripheral smear, reticulocyte count, stool for occult blood, serum iron, total iron binding capacity, bilirubin, and, if appropriate, vitamin B12 and folate may be of value in attempting to identify the cause of the anemia.

If a peripheral neuropathy is suspected, nerve conduction studies are warranted both for diagnosis and as a basis to monitor any therapy.

If renal disease is questioned, a 24 hour urine collection for creatinine clearance, protein, and electrolytes may be indicated. Elevated uric acid levels may result from lead-induced renal disease and a serum uric acid level might be performed.

An electrocardiogram and chest X ray may be obtained as deemed appropriate.

Sophisticated and highly specialized testing should not be done routinely and where indicated should be under the direction of a specialist.

#### (5) Laboratory evaluation.

The blood lead level at present remains the single most important test to monitor lead exposure and is the test used in

the medical surveillance program under the lead standard to guide employee medical removal. The ZPP has several advantages over the blood lead level. Because of its relatively recent development and the lack of extensive data concerning its interpretation, the ZPP currently remains an ancillary test.

This section will discuss the blood lead level and ZPP in detail and will outline their relative advantages and disadvantages. Other blood tests currently available to evaluate lead exposure will also be reviewed.

The blood lead level is a good index of current or recent lead absorption when there is no anemia present and when the worker has not taken any chelating agents. However, blood lead levels along with urinary lead levels do not necessarily indicate the total body burden of lead and are not adequate measures of past exposure. One reason for this is that lead has a high affinity for bone and up to 90% of the body's total lead is deposited there. A very important component of the total lead body burden is lead in soft tissue (liver, kidney, and brain). This fraction of the lead body burden, the biologically active lead, is not entirely reflected by blood lead levels since it is a function of the dynamics of lead absorption, distribution, deposition in bone and excretion. Following discontinuation of exposure to lead, the excess body burden is only slowly mobilized from bone and other relatively stable body stores and excreted. Consequently, a high blood lead level may only represent recent heavy exposure to lead without a significant total body excess and likewise a low blood lead level does not exclude an elevated total body burden of lead.

Also due to its correlation with recent exposures, the blood lead level may vary considerably over short time intervals.

To minimize laboratory error and erroneous results due to contamination, blood specimens must be carefully collected after thorough cleaning of the skin with appropriate methods using lead-free blood containers and analyzed by a reliable laboratory. Under the standard, samples must be analyzed in laboratories which are approved by OSHA. Analysis is to be made using atomic absorption spectrophotometry, anodic stripping voltammetry or any method which meets the accuracy requirements set forth by the standard.

The determination of lead in urine is generally considered a less reliable monitoring technique than analysis of whole blood primarily due to individual variability in urinary excretion capacity as well as the technical difficulty of obtaining accurate 24 hour urine collections. In addition, workers with renal insufficiency, whether due to lead or some other cause, may have decreased lead clearance and consequently urine lead levels may underestimate the true lead burden. Therefore, urine lead levels should not be used as a routine test.

The zinc protoporphyrin test, unlike the blood lead determination, measures an adverse metabolic effect of lead and as such is a better indicator of lead toxicity than the level of blood lead itself. The level of ZPP reflects lead absorption over the preceding 3 to 4 months, and therefore is a better indicator of lead body burden. The ZPP requires more time than the blood lead to read significantly elevated levels; the return to normal after discontinuing lead exposure is also slower. Furthermore, the ZPP test is simpler, faster, and less expensive to perform and no contamination is possible. Many

investigators believe it is the most reliable means of monitoring chronic lead absorption.

Zinc protoporphyrin results from the inhibition of the enzyme ferrochelatase which catalyzes the insertion of an iron molecule into the protoporphyrin molecule, which then becomes heme. If iron is not inserted into the molecule then zinc, having a greater affinity for protoporphyrin, takes the place of the iron, forming ZPP.

An elevation in the level of circulating ZPP may occur at blood lead levels as low as 20-30 µg/dl in some workers. Once the blood lead level has reached 40 µg/dl there is more marked rise in the ZPP value from its normal range of less than 100 µg/dl 100 ml. Increases in blood lead levels beyond 40 µg/100 g are associated with exponential increases in ZPP.

Whereas blood lead levels fluctuate over short time spans, ZPP levels remain relatively stable. ZPP is measured directly in red blood cells and is present for the cell's entire 120 day life-span. Therefore, the ZPP level in blood reflects the average ZPP production over the previous 3-4 months and consequently the average lead exposure during that time interval.

It is recommended that a hematocrit be determined whenever a confirmed ZPP of 50 µg/100 ml whole blood is obtained to rule out a significant underlying anemia. If the ZPP is in excess of 100 µg/100 ml and not associated with abnormal elevations in blood lead levels, the laboratory should be checked to be sure that blood leads were determined using atomic absorption spectrophotometry anodic stripping voltammetry, or any method which meets the accuracy requirements set forth by the standard by an OSHA approved laboratory which is experienced in lead level determinations. Repeat periodic blood lead studies should be obtained in all individuals with elevated ZPP levels to be certain that an associated elevated blood lead level has not been missed due to transient fluctuations in blood leads.

ZPP has a characteristic fluorescence spectrum with a peak at 594 nm which is detectable with a hematofluorimeter. The hematofluorimeter is accurate and portable and can provide on-site, instantaneous results for workers who can be frequently tested via a finger prick.

Careful attention must be given to calibration and quality control procedures. Limited data on blood lead-ZPP correlations and the ZPP levels which are associated with the adverse health effects discussed in subsection (3) are the major limitations of the test. Also it is difficult to correlate ZPP levels with environmental exposure and there is some variation of response with age and sex. Nevertheless, the ZPP promises to be an important diagnostic test for the early detection of lead toxicity and its value will increase as more data is collected regarding its relationship to other manifestations of lead poisoning.

Levels of delta-aminolevulinic acid (ALA) in the urine are also used as a measure of lead exposure. Increasing concentrations of ALA are believed to result from the inhibition of the enzyme delta-aminolevulinic acid dehydrase (ALA-D). Although the test is relatively easy to perform, inexpensive, and rapid, the disadvantages include variability in results, the necessity to collect a complete 24 hour urine sample which has a specific gravity greater than 1.010, and also the fact that ALA decomposes in the presence of light.

The pattern of porphyrin excretion in the urine can also be helpful in identifying lead intoxication. With lead poisoning, the urine concentrations of coproporphyrins I and II, porphobilinogen and uroporphyrin I rise. The most important increase, however, is that of coproporphyrin III; levels may exceed 5,000 µg/l in the urine in lead poisoned individuals, but its correlation with blood lead levels and ZPP are not as good as those of ALA. Increases in urinary porphyrins are not diagnostic of lead toxicity and may be seen in porphyria, some liver diseases, and in patients with high reticulocyte counts.

**Summary.** The Washington Industrial Safety and Health Act's standard for inorganic lead in the construction industry places significant emphasis on the medical surveillance of all workers exposed to levels of inorganic lead above 30 µg/m<sup>3</sup> TWA. The physician has a fundamental role in this surveillance program, and in the operation of the medical removal protection program.

Even with adequate worker education on the adverse health effects of lead and appropriate training in work practices, personal hygiene and other control measures, the physician has a primary responsibility for evaluating potential lead toxicity in the worker. It is only through a careful and detailed medical and work history, a complete physical examination and appropriate laboratory testing that an accurate assessment can be made. Many of the adverse health effects of lead toxicity are either irreversible or only partially reversible and therefore early detection of disease is very important.

This document outlines the medical monitoring program as defined by the occupational safety and health standard for inorganic lead. It reviews the adverse health effects of lead poisoning and describes the important elements of the history and physical examinations as they relate to these adverse effects. Finally, the appropriate laboratory testing for evaluating lead exposure and toxicity is presented.

It is hoped that this review and discussion will give the physician a better understanding of the WISHA standard with the ultimate goal of protecting the health and well-being of the worker exposed to lead under their care.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17654, filed 10/29/93, effective 12/10/93.]

## PART B-2 HAZARD COMMUNICATION

### WAC 296-155-180 Hazard communication. General.

The employer shall develop and maintain a chemical hazard communication program as required by WAC 296-800-170, which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-180, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-155-180, filed 8/3/94, effective 9/12/94; 89-11-035 (Order 89-03), § 296-155-180, filed 5/15/89, effective 6/30/89.]

**PART C**  
**PERSONAL PROTECTIVE AND LIFE SAVING**  
**EQUIPMENT**

**WAC 296-155-200 General requirements for personal protective equipment (PPE).** (1) Supplying personal protective equipment

(a) Personal protective equipment (PPE) must be used wherever physical contact, absorption, or inhalation of a hazard could cause any injury or impairment to the function of any part of the body.

These hazards include:

- Hazardous processes;
- Environmental hazards;
- Chemical hazards;
- Radiological hazards;

**OR**

- Mechanical irritants.

**Note:** PPE includes:

- Protective equipment for eyes, face, head, hearing, and extremities;
- Protective clothing;
- Respiratory devices;

**AND**

- Protective shields and barriers.

(b) PPE must be maintained in a sanitary and reliable condition.

**Reference:** For requirements on maintaining specific personal protective equipment (PPE), see the following rules.

- Chapter 296-842 WAC, Respirators;

**AND**

- Chapter 296-817 WAC, Hearing loss prevention.

(c) If employees provide their own protective equipment, then the employer is responsible to make sure the PPE is:

- Adequate;
- Properly maintained;

**AND**

- Sanitary.

(d) All personal protective equipment must be of safe design and construction for the work to be performed.

(2) Minimum clothing requirements.

(a) Employers must ensure that employees wear at least:

- A short-sleeved shirt;
- Long pants;

**AND**

• Shoes that meet the requirements of WAC 296-155-212, Foot protection.

**Definition:**

A *short-sleeved shirt* covers the top of the shoulder and has material extending down the arm. If a short-sleeved shirt has a seam at the end of the shoulder, the material must extend down the arm from the seam.

*Long pants* have legs that extend past the knee when the wearer stands and leaves no exposed skin on the lower leg.

(b) Where there is a danger of contact with moving parts of machinery, or the work process is such that a hazard exists:

• The clothing of employees must fit closely about the body.

• Dangling neck wear, bracelets, wristwatches, rings, or similar articles must not be worn by employees.

**Note:** For additional related requirements see WAC 296-155-205, Head protection.

(3) The employer must require employees to wear appropriate PPE in all operations where:

- There is an exposure to hazardous conditions;

**OR**

• WAC 296-155-200, General requirements for personal protective equipment (PPE), indicates a need for using such equipment to reduce the hazards to the employees.

(4) Employees must comply with job safety practices and procedures and PPE requirements that are relevant to the job site.

(5) High visibility garments.

(a) During daylight hours, when employees' duties are performed in close proximity to moving vehicles, employers must make sure that employees wear a high-visibility safety vest, shirt, or jacket that is fluorescent yellow-green, fluorescent orange-red, or fluorescent red in color. This garment must always be worn as an outer garment.

**Definition:**

For the purpose of this rule, *hours of darkness* means from one-half hour before sunset to one-half hour after sunrise.

(b) During hours of darkness, when employees' duties are performed in close proximity to moving vehicles, the employer must make sure that employees wear, at a minimum, a high-visibility safety vest, shirt, or jacket:

• Designed according to ANSI/ISEA 107-1999 Class 2 specifications;

- Worn as an outer garment;

**AND**

• Worn to provide three hundred sixty degrees of visibility around the employee.

**Note:** A high-visibility garment meets Class 2 specifications if the garment:

- Has an ANSI "Class 2" label;

**OR**

- Has at least seven hundred seventy-five square inches of background material and two hundred one square inches of retroreflective material that encircles the torso and is placed to provide three hundred sixty degrees of visibility around the employee.

**Note:** Fading and soiling may degrade the high-visibility characteristics of the garments.

- ANSI/ISEA 107-1999 is available by:

– Purchasing copies of ANSI/ISEA 107-1999 by writing:

– American National Standards Institute

11 West 42nd Street

New York, NY 10036

**OR**

– Contacting the ANSI web site at <http://web.ansi.org/>.

**OR**

- Reading a copy of ANSI/ISEA 107-1999 at any Washington state library.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 04-24-089, § 296-155-200, filed 12/1/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-200, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-200, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-200, filed 1/21/86; Order 76-29, § 296-155-200, filed 9/30/76; Order 74-26, § 296-155-200, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-201 Definitions applicable to this chapter.** (1) "Catenary life line" means a horizontal rope between two fixed anchorages, independent of the work surface, to which the lanyard is attached, either by tying or by means of a sliding connection. A catenary life line shall be

capable of supporting a minimum dead weight of 5,400 pounds per person, applied at the midpoint of the line.

(2) "Contaminant" means any material which by reason of its action upon, within, or to a person or object is likely to cause physical harm.

(3) "Dropline" means a vertical rope from a fixed anchorage, independent of the work surface, to which the lanyard is affixed or tied.

(4) "Fixed anchorage" means a secure point of attachment, not a part of the work surface, for droplines, lifelines, catenary life lines, or lanyards. The fixed anchorage and its appurtenances shall be capable of supporting a minimum dead weight of 5,400 pounds per worker.

(5) "Lanyard" means a rope, suitable for supporting one person. One end is fastened to a safety belt or harness and the other end is secured to a substantial object or a safety line.

(6) "Lifeline" means a rope, suitable for supporting one person, to which a lanyard or safety belt (or harness) is attached.

(7) "O.D." means optical density and refers to the light refractive characteristics of a lens.

(8) "Radiant energy" means energy that travels outward in all directions from its source.

(9) "Safety belt" means a device, usually worn around the waist which, by reason of its attachment to a lanyard and lifeline or a structure, will prevent a worker from falling.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-201, filed 1/21/86; Order 76-6, § 296-155-201, filed 3/1/76.]

**WAC 296-155-203 Confined spaces.** All work conducted in a confined space shall comply with the provisions of chapter 296-62 WAC Part M, and the following sections.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-203, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-203, filed 1/21/86.]

**WAC 296-155-20301 Definitions. Confined space** means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and

(3) Is not designed for continuous employee occupancy.

**"Corrosives"** means substances which in contact with living tissue cause destruction of the tissue by chemical action.

**"Hazardous atmosphere"** means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL);

(2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52m) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

(4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in chapter 296-62 WAC, general occupational health standards, or chapter 296-841 WAC, identifying and controlling respiratory hazards, and which could result in employee exposure in excess of its dose or permissible exposure limit;

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

Note: For air contaminants for which WISHA has not determined a dose or permissible exposure limit, other sources of information, such as material safety data sheets that comply with the Chemical Hazard Communication Standard, WAC 296-800-170, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

**"Irritants"** means substances which on immediate, prolonged, or repeated contact with normal living tissue will induce a local inflammatory reaction.

**"Oxygen deficient atmospheres"** means atmospheres at sea level having less than 19.5% oxygen by volume or having a partial pressure of 148 millimeters of mercury or less. This may deviate when working at higher altitudes and should be determined for an individual location. Factors such as acclimatization, physical condition of persons involved, etc., must be considered for such circumstances and conditions. (See chapter 296-62 WAC, Part M, permit-required confined spaces.)

**"Toxicants"** means substances which have the inherent capacity to produce personal injury or illness to persons by absorption through any body surface.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-155-20301, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-20301, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-155-20301, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-20301, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-155-20301, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-20301, filed 1/21/86.]

**WAC 296-155-20307 Confined space work on sewer systems under construction.** New systems under construction or new installations which have not yet been connected to a used system, may substitute forced ventilation for the testing requirements of chapter 296-62 WAC Part M provided:

(1) Ventilation is effectively provided at least five minutes prior to entry into the confined space;

(2) Ventilation is provided, as required by WAC 296-62-110, et seq., which supplies a continuous flow of air;

(3) Ventilation exhaust is discharged so as to present no hazard to other employees;

(4) An attendant is provided at the surface when there are employees in the manhole or pipe. The attendant shall not leave the manhole unattended until such time as all employees are out and the cover has been replaced; and

(5) All other requirements for confined spaces are observed. See chapter 296-62 WAC Part M.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-20307, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-20307, filed 1/21/86.]

**WAC 296-155-205 Head protection.** (1) All employees on any construction site shall be provided an individual hard hat which meets all requirements of (a) and (b) of this subsection. Employers shall provide individual hard hats at no cost to the employees.

(a) Hard hats for the protection of employees against impact and/or penetration of falling and flying objects shall meet the specifications contained in American National Standards Institute, Z89.1-1969, Safety Requirements for Industrial Head Protection.

(b) Hard hats for the head protection of employees exposed to high voltage electrical shock and burns shall meet the specifications contained in American National Standards Institute, Z89.2-1971.

(2) All employees must have their individual hard hats on site and readily available at all times.

(3) All employees shall wear a hard hat on any construction site whenever there is a potential exposure to danger of flying or falling objects to persons working or occupying the area.

Note: The hard hat may be removed whenever there is no potential exposure to a hazard.

(4)(a) Employees working on asphalt paving crews exposed to extreme temperatures from hot mix and not exposed to falling objects do not have to wear protective hard hats.

(b) Flaggers working with asphalt paving operations must comply with the requirements of WAC 296-155-305.

(5) Caps with metal buttons or metal visors shall not be worn around electrical hazards.

(6) Employees working near moving machinery or in locations which present a hair-catching or fire hazard shall wear caps, nets or other head and face protection that will completely contain the hair.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, 2000 c 239, and chapter 34.05 RCW. 01-04-015, § 296-155-205, filed 1/26/01, effective 2/28/01. Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-155-205, filed 5/20/91, effective 6/20/91; 89-11-035 (Order 89-03), § 296-155-205, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-205, filed 1/21/86; Order 74-26, § 296-155-205, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-210 Hearing protection.** The hearing protection requirements of chapter 296-817 WAC, Hearing loss prevention (noise), apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-155-210, filed 5/19/03, effective 8/1/03. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-155-210, filed 11/30/83; Order 74-26, § 296-155-210, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-211 Leg protection.** Employees whose duties require them to operate a power chain saw shall wear flexible ballistic nylon pads, sewn or otherwise fastened into

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the trousers, or other equivalent protection that will protect the vulnerable areas of the legs.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-211, filed 1/21/86.]

**WAC 296-155-212 Foot protection.** (1) Substantial footwear, made of leather or other equally firm material, shall be worn by employees in any occupation in which there is a danger of injury to the feet through falling or moving objects, or from burning, scalding, cutting, penetration, or like hazard.

(a) The soles and heels of such footwear shall be of a material that will not create a slipping hazard.

(b) Shoes made of leather or other firm materials that have soft athletic-type soles which would protect employees from foot injuries and at the same time, provide soft and firm footing while working under specialty requirements or with specialty materials are acceptable if meeting safety shoe requirements established by OSHA or ANSI.

(c) Footwear that has deteriorated to a point where it does not provide the required protection shall not be used.

(2) Calks or other suitable footwear, which will afford reasonable protection from slipping, shall be worn while working on logs, poles, pilings, or similar forest products.

(3) Traditional tennis shoes, shoes with canvas tops, or thin or soft soled athletic shoes, open toed sandals, slippers, dress shoes or other similar type shoes shall not be worn. Soft or athletic-type soles with uppers of leather or other substantial material may be used where firm footing is desired and where minimal danger of injury to feet from falling or moving objects.

(4) Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1-1967.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-212, filed 7/20/94, effective 9/20/94; 89-11-035 (Order 89-03), § 296-155-212, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-212, filed 1/21/86; Order 74-26, § 296-155-212, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-215 Eye and face protection.** (1) General.

(a) Employees shall use eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.

(b) Eye and face protection equipment required by this part shall meet the requirements specified in American National Standards Institute, Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection.

(c) Employees whose vision requires the use of corrective lenses in spectacles, when required by this regulation to wear eye protection, shall be protected by goggles or spectacles of one of the following types:

(i) Spectacles whose protective lenses provide optical correction;

(ii) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(iii) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(d) Face and eye protection equipment shall be kept clean and in good repair. The use of this type equipment with structural or optical defects shall be prohibited.

[Title 296 WAC—p. 2059]

(e) Table C-1 shall be used as a guide in the selection of face and eye protection for the hazards and operations noted.

(f) Protectors shall meet the following minimum requirements:

(i) They shall provide adequate protection against the particular hazards for which they are designed.

(ii) They shall be reasonably comfortable when worn under the designated conditions.

(iii) They shall fit snugly and shall not unduly interfere with the movements of the wearer.

(iv) They shall be durable.

(v) They shall be capable of being disinfected.

(vi) They shall be easily cleanable.

(g) Every protector shall be distinctly marked to facilitate identification only of the manufacturer.

(h) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.

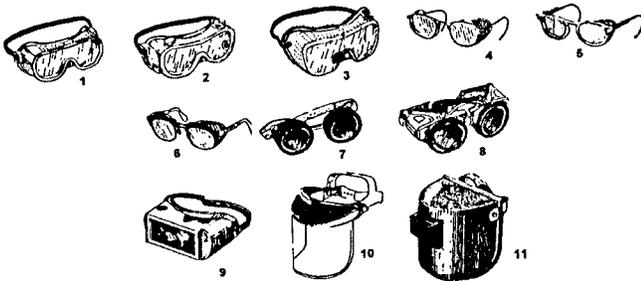


TABLE C-1

EYE AND FACE PROTECTION SELECTION GUIDE

1. GOGGLES, flexible fitting, regular ventilation
2. GOGGLES, flexible fitting, hooded ventilation
3. GOGGLES, cushioned fitting, rigid body
- \*4. SPECTACLES, metal frame, with sideshields
- \*5. SPECTACLES, plastic frame with sideshields
- \*6. SPECTACLES, metal-plastic frame, with sideshields
- \*\*7. WELDING GOGGLES, eyecup type, tinted lenses (illustrated)
- 7A. CHIPPING GOGGLES, eyecup type, clear safety lenses (not illustrated)
- \*\*8. WELDING GOGGLES, coverspec type tinted lenses (illustrated)
- 8A. CHIPPING GOGGLES, coverspec type, clear safety lenses (not illustrated)
- \*\*9. WELDING GOGGLES, coverspec type, tinted plate lens
10. FACE SHIELD (available with plastic or mesh window)
11. WELDING HELMETS

\* Nonside shield spectacles are available for limited hazard use requiring only frontal protection.

\*\* See Table C-2 in (2) of this section, Filter lens shade numbers for protection against radiant energy.

APPLICATIONS		
OPERATION	HAZARDS	RECOMMENDED PROTECTORS: Underscored Numbers Signify Preferred Protection
ACETYLENE-BURNING	SPARKS, HARMFUL RAYS, MOLTEN METAL, FLYING PARTICLES	<u>7</u> , <u>8</u> , <u>9</u>
ACETYLENE-CUTTING		
ACETYLENE-WELDING		
CHEMICAL HANDLING	SPLASH, ACID BURNS, FUMES	<u>2</u> , 10 (for severe exposure add <u>10</u> over 2)
CHIPPING	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>7A</u> , <u>8A</u>

APPLICATIONS		
OPERATION	HAZARDS	RECOMMENDED PROTECTORS: Underscored Numbers Signify Preferred Protection
ELECTRIC (ARC) WELDING	SPARKS, INTENSE RAYS, MOLTEN METAL	<u>9</u> , <u>11</u> (11 in combination with 4, 5, 6, in tinted lenses, advisable)
FURNACE OPERATIONS	GLARE, HEAT, MOLTEN METAL	<u>7</u> , <u>8</u> , <u>9</u> (for severe exposure add <u>10</u> )
GRINDING-LIGHT	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>
GRINDING-HEAVY	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>7A</u> , <u>8A</u> (for severe exposure add <u>10</u> )
LABORATORY	CHEMICAL SPLASH, GLASS BREAKAGE	<u>2</u> (10 when in combination with <u>4</u> , <u>5</u> , <u>6</u> )
MACHINING	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>
MOLTEN METALS	HEAT, GLARE, SPARKS, SPLASH	<u>7</u> , <u>8</u> (10 in combination with <u>4</u> , <u>5</u> , <u>6</u> , in tinted lenses)
SPOT WELDING	FLYING PARTICLES, SPARKS	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>

(2) Protection against radiant energy. (a) Selection of shade numbers for welding filter. Table C-2 shall be used as a guide for the selection of the proper shade numbers of filter lenses or plates used in welding. Shades more dense than those listed may be used to suit the individual's needs.

TABLE C-2  
FILTER LENS SHADE NUMBERS FOR PROTECTION AGAINST RADIANT ENERGY

Welding Operation	Shade number
Shielded metal-arc welding 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	10
Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	12
Shielded metal-arc welding 3/16-, 7/32-, 1/4-inch diameter electrodes	12
5/16-, 3/8-inch diameter electrodes	14
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Gas welding (light), up to 1/8-inch	4 or 5
Gas welding (medium), 1/8-inch to 1/2-inch	5 or 6
Gas welding (heavy), over 1/2-inch	6 or 9

(b) Laser protection.

(i) Employees whose occupation or assignment requires potentially hazardous exposure (see WAC 296-62-09005(4)) to laser radiation shall wear suitable laser safety goggles which will protect for the specific wavelength of the laser and be of optical density (O.D.) adequate for the energy involved. Table C-3 lists the maximum power or energy density for which adequate protection is afforded by glasses of optical densities from 5 through 8.

TABLE C-3 SELECTING LASER SAFETY GLASS		
CW maximum power density (watts/cm <sup>2</sup> )	INTENSITY	ATTENUATION
	Optical density (O.D.)	Attenuation factor
10 <sup>-2</sup>	5	10 <sup>5</sup>
10 <sup>-1</sup>	6	10 <sup>6</sup>
1.0	7	10 <sup>7</sup>
10.0	8	10 <sup>8</sup>

Output levels falling between lines in this table shall require the higher optical density.

(ii) All protective goggles shall bear a label identifying the following data:

- (a) The laser wavelengths for which use is intended;
- (b) The optical density of those wavelengths.
- (c) The visible light transmission.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-215, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-01-022 (Order 84-24), § 296-155-215, filed 12/11/84; Order 74-26, § 296-155-215, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-220 Respiratory protection.** The respiratory protection requirements applicable to construction work under this section are identical to those set forth in chapter 296-842 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-155-220, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-10-071, § 296-155-220, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-15-017 (Order 83-19), § 296-155-220, filed 7/13/83, effective 9/12/83; Order 74-26, § 296-155-220, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-235 Working over or adjacent to water.** (1) When an employee is employed under conditions which expose them to a risk of drowning, they shall wear a U.S. Coast Guard approved life saving device, unless it can be shown that conditions, such as shallow water, are such that flotation would not be achieved.

(2) Prior to and after each use, the buoyant life saving device shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

(3) Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

(4) At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water. Each skiff, or skiffs, shall:

- (a) Be suitable for conditions where used.
- (b) Be equipped with oar locks securely attached to gun-wales, oars, one boat hook, and one cork ring buoy with fifty feet of suitable line attached.

(5) Whenever boats or skiffs cannot be used, due to swift currents, life lines close to the water surface shall be provided and, wherever practicable, a line shall be stretched across the stream with tag lines.

(6) Where workers are transported by boat or barge, only such number of persons shall be carried that can be safely accommodated on fixed seats. Capacity showing number of persons shall be plainly marked on vessel.

(7) All workers shall be provided with a U.S. Coast Guard approved buoyant life saving device while transported in open boats and/or barges, and where deemed necessary by the department, workers shall wear same while in transport.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-235, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-235, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-240 Sterilization of protective equipment.** Goggles, gloves, respirators and other protectors shall

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not be interchanged among employees for use unless they have been thoroughly cleaned since last use.

[Order 74-26, § 296-155-240, filed 5/7/74, effective 6/6/74.]

## PART C-1 FALL RESTRAINT AND FALL ARREST

### WAC 296-155-245 Reserve.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-245, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-245, filed 4/25/95, effective 10/1/95.]

**WAC 296-155-24501 Scope and application.** This section sets forth requirements for employers to provide and enforce the use of fall protection for employees in construction, alteration, repair, maintenance (including painting and decorating), demolition workplaces, and material handling covered under chapter 296-155 WAC.

Note: See Appendix B for additional standards that require the use of fall restraint and/or fall arrest protection.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-24501, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-24501, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24501, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24501, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-24503 Definitions. Anchorage** means a secure point of attachment for lifelines, lanyards, or deceleration devices which is capable of withstanding the forces specified in the applicable sections of chapter 296-155 WAC.

**Approved** means, for the purpose of this section; tested and certified by the manufacturer, or any recognized national testing laboratory, to possess the strength requirements specified in this section.

**Body belt** means a Type I safety belt used in conjunction with lanyard or lifeline for fall restraint only.

**Full body harness** means a configuration of connected straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration devices.

**Full body harness system** means a Class III full body harness and lanyard which is attached to an anchorage meeting the requirements of chapter 296-155 WAC, Part C-1; or attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in the applicable sections of chapter 296-155 WAC.

**Catenary line** - see horizontal lifeline.

**Competent person** means an individual knowledgeable of fall protection equipment, including the manufacturers recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing and potential fall hazards; and who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

**Connector** means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an inte-

gral component of part of the system (such as a buckle or dee ring sewn into a body belt or body harness, or a snap hook spliced or sewn to a lanyard or self-retracting lanyard).

**Continuous fall protection** means the design and use of a fall protection system such that no exposure to an elevated fall hazard occurs. This may require more than one fall protection system or a combination of prevention or protection measures.

**Control zone** means the area between the warning line and the unprotected sides and edges of the walking/working surface.

**Deceleration device** means any mechanism, such as a rope grab, ripstitch lanyard, specifically woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

**Deceleration distance** means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

**Drop line** means a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

**Failure** means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

**Fall arrest system** means the use of multiple, approved safety equipment components such as; body harnesses, lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged as to arrest a free fall. Compliance with anchorage strength requirements specified in the applicable sections of chapter 296-155 WAC, Part C-1 shall constitute approval of the anchorage.

**Fall protection work plan** means a written planning document in which the employer identifies all areas on the job site where a fall hazard of 10 feet or greater exists. The plan describes the method or methods of fall protection to be utilized to protect employees, and includes the procedures governing the installation use, inspection, and removal of the fall protection method or methods which are selected by the employer. (See WAC 296-155-24505.)

**Fall restraint system** means an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level. When standard guardrails are selected, compliance with applicable sections governing their construction and use shall constitute approval.

**Fall distance** means the actual distance from the worker's support to the level where a fall would stop.

**Free fall** means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

**Free fall distance** means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance

excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

**Hardware** means snap hooks, D rings, bucklers, carabiners, adjusters, O rings, that are used to attach the components of a fall protection system together.

**Horizontal lifeline** means a rail, rope, wire, or synthetic cable that is installed in a horizontal plane between two anchorages and used for attachment of a worker's lanyard or lifeline device while moving horizontally; used to control dangerous pendulum like swing falls.

**Lanyard** means a flexible line of webbing, rope, or cable used to secure a body belt or harness to a lifeline or an anchorage point usually 2, 4, or 6 feet long.

**Leading edge** means the advancing edge of a floor, roof, or formwork which changes location as additional floor, roof, or formwork sections are placed, formed, or constructed. Leading edges not actively under construction are considered to be "unprotected sides and edges," and positive methods of fall arrest or fall restraint shall be required to protect exposed workers.

**Lifeline** means a vertical line from a fixed anchorage or between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured. Lifeline as referred to in this text is one which is part of a fall protection system used as back-up safety for an elevated worker.

**Locking snap hook** means a connecting snap hook that requires two separate forces to open the gate; one to deactivate the gatekeeper and a second to depress and open the gate which automatically closes when released; used to minimize roll out or accidental disengagement.

**Low pitched roof** means a roof having a slope equal to or less than 4 in 12.

**Mechanical equipment** means all motor or human propelled wheeled equipment except for wheelbarrows, mop-carts, robotic thermoplastic welders and robotic crimpers.

**Positioning belt** means a single or multiple strap that can be secured around the worker's body to hold the user in a work position; for example, a lineman's belt, a rebar belt, or saddle belt.

**Positioning device system** means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

**Restraint line** means a line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to prevent the worker from falling to a lower level.

**Roll out** means unintentional disengagement of a snap hook caused by the gate being depressed under torque or contact while twisting or turning; a particular concern with single action snap hooks that do not have a locking gatekeeper.

**Roof** means the exterior surface on the top of a building. This does not include floors or form work which, because a building has not been completed, temporarily become the top surface of a building.

**Roofing work** means the hoisting, storage, application, and removal of roofing materials and equipment, including

related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

**Rope grab** means a fall arrester that is designed to move up or down a lifeline suspended from a fixed overhead or horizontal anchorage point, or lifeline, to which the belt or harness is attached. In the event of a fall, the rope grab locks onto the lifeline rope through compression to arrest the fall. The use of a rope grab device is restricted for all restraint applications. (Refer to WAC 296-155-24510 (1)(b)(iii)).

**Safety line** - see lifeline.

**Safety monitor system** means a system of fall restraint used in conjunction with a warning line system only, where a competent person as defined by this part, having no additional duties, monitors the proximity of workers to the fall hazard when working between the warning line and the unprotected sides and edges including, the leading edge of a low pitched roof or walking/working surface.

**Self retracting lifeline** means a deceleration device which contains a drum wound line which may be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which after onset of a fall, automatically locks the drum and arrests the fall.

**Shock absorbing lanyard** means a flexible line of webbing, cable, or rope used to secure a body belt or harness to a lifeline or anchorage point that has an integral shock absorber.

**Single action snap hook** means a connecting snap hook that requires a single force to open the gate which automatically closes when released.

**Snap hook** means a self-closing connecting device with a gatekeeper latch or similar arrangement that will remain closed until manually opened. This includes single action snap hooks that open when the gatekeeper is depressed and double action snap hooks that require a second action on a gatekeeper before the gate can be opened.

**Static line** - see horizontal lifeline.

**Strength member** means any component of a fall protection system that could be subject to loading in the event of a fall.

**Steep roof** means a roof having a slope greater than 4 in 12.

**Unprotected sides and edges** means any side or edge (except at entrances to points of access) of a floor, roof, ramp or runway where there is no wall or guardrail system as defined in WAC 296-155-505(7).

**Walking/working surface** means for the purpose of this section, any area whose dimensions are 45 inches or greater in all directions, through which workers pass or conduct work.

**Warning line system** means a barrier erected on a walking and working surface or a low pitch roof (4 in 12 or less), to warn employees that they are approaching an unprotected fall hazard(s).

**Work area** means that portion of a walking/working surface where job duties are being performed.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-24503, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24503, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24503, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24503, filed 1/10/91, effective 2/12/91.]

(2007 Ed.)

### WAC 296-155-24505 Fall protection work plan. (1)

The employer shall develop and implement a written fall protection work plan including each area of the work place where the employees are assigned and where fall hazards of 10 feet or more exist.

(2) The fall protection work plan shall:

(a) Identify all fall hazards in the work area.

(b) Describe the method of fall arrest or fall restraint to be provided.

(c) Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used.

(d) Describe the correct procedures for the handling, storage, and securing of tools and materials.

(e) Describe the method of providing overhead protection for workers who may be in, or pass through the area below the work site.

(f) Describe the method for prompt, safe removal of injured workers.

(g) Be available on the job site for inspection by the department.

(3) Prior to permitting employees into areas where fall hazards exist the employer shall:

(a) Ensure that employees are trained and instructed in the items described in subsection (2)(a) through (f) of this section.

(b) Inspect fall protection devices and systems to ensure compliance with WAC 296-155-24510.

(4) Training of employees:

(a) The employer shall ensure that employees are trained as required by this section. Training shall be documented and shall be available on the job site.

(b) "Retraining." When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by subsection (1) of this section, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

- Changes in the workplace render previous training obsolete; or

- Changes in the types of fall protection systems or equipment to be used render previous training obsolete; or

- Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

Note: The following appendices to Part C-1 of this chapter serve as nonmandatory guidelines to assist employers in complying with the appropriate requirements of Part C-1 of this chapter.

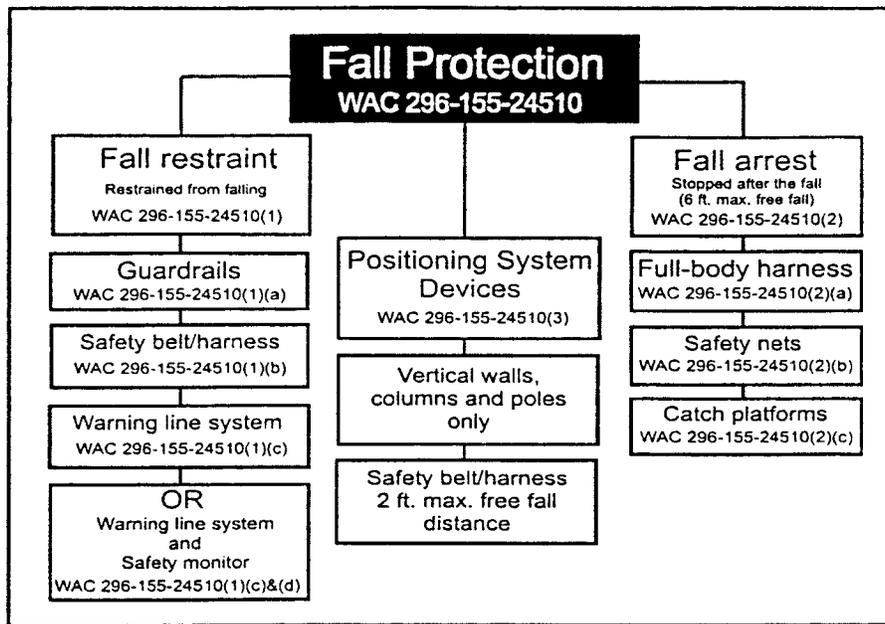
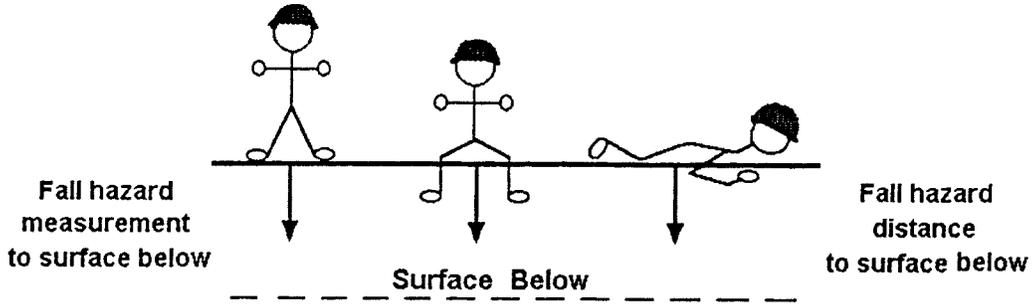
[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-24505, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24505, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24505, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24505, filed 1/10/91, effective 2/12/91.]

### WAC 296-155-24507 Reserve.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24507, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24507, filed 4/25/95, effective 10/1/95.]

**WAC 296-155-24510 Fall restraint, fall arrest systems.** When employees are exposed to a hazard of falling from a location 10 feet or more in height, the employer shall ensure that fall restraint, fall arrest systems or positioning

device systems are provided, installed, and implemented according to the following requirements.



- (1) Fall restraint protection shall consist of:
  - (a) Standard guardrails as described in chapter 296-155 WAC, Part K.
  - (b) Safety belts and/or harness attached to securely rigged restraint lines.
    - (i) Safety belts and/or harness shall conform to ANSI Standard:
      - Class I body belt
      - Class II chest harness
      - Class III full body harness
      - Class IV suspension/position belt
    - (ii) All safety belt and lanyard hardware assemblies shall be capable of withstanding a tensile loading of 4,000 pounds without cracking, breaking, or taking a permanent deformation.
    - (iii) Rope grab devices are prohibited for fall restraint applications unless they are part of a fall restraint system designed specifically for the purpose by the manufacturer, and used in strict accordance with the manufacturer's recommendations and instructions.

- (iv) The employer shall ensure component compatibility.
- (v) Components of fall restraint systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength have been adversely affected.
  - (vi) Anchorage points used for fall restraint shall be capable of supporting 4 times the intended load.
  - (vii) Restraint protection shall be rigged to allow the movement of employees only as far as the sides and edges of the walking/working surface.
- (c) A warning line system as prescribed in WAC 296-155-24515(3) and supplemented by the use of a safety monitor system as prescribed in WAC 296-155-24521 to protect workers engaged in duties between the forward edge of the warning line and the unprotected sides and edges, including the leading edge, of a low pitched roof or walking/working surface.
- (d) Warning line and safety monitor systems as described in WAC 296-155-24515 (3) through (4)(f) and

296-155-24520 respectively are prohibited on surfaces exceeding a 4 in 12 pitch, and on any surface whose dimensions are less than 45 inches in all directions.

(2) Fall arrest protection shall consist of:

(a) Full body harness system.

(i) An approved Class III full body harness shall be used.

(ii) Body harness systems or components subject to impact loading shall be immediately removed from service and shall not be used again for employee protection unless inspected and determined by a competent person to be undamaged and suitable for reuse.

(iii) All safety lines and lanyards shall be protected against being cut or abraded.

(iv) The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

(v) Body harness systems shall be rigged to minimize free fall distance with a maximum free fall distance allowed of 6 feet, and such that the employee will not contact any lower level.

(vi) Hardware shall be drop forged, pressed or formed steel, or made of materials equivalent in strength.

(vii) Hardware shall have a corrosion resistant finish, and all surfaces and edges shall be smooth to prevent damage to the attached body harness or lanyard.

(viii) When vertical lifelines (droplines) are used, not more than one employee shall be attached to any one lifeline.

Note: The system strength needs in the following items are based on a total combined weight of employee and tools of no more than 310 pounds. If combined weight is more than 310 pounds, appropriate allowances must be made or the system will not be deemed to be in compliance.

(ix) Full body harness systems shall be secured to anchorages capable of supporting 5,000 pounds per employee except: When self retracting lifelines or other deceleration devices are used which limit free fall to two feet, anchorages shall be capable of withstanding 3,000 pounds.

(x) Vertical lifelines (droplines) shall have a minimum tensile strength of 5,000 pounds (22.2 kN), except that self retracting lifelines and lanyards which automatically limit free fall distance to two feet (.61 m) or less shall have a minimum tensile strength of 3,000 pounds (13.3 kN).

(xi) Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.

(xii) Lanyards shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

(xiii) All components of body harness systems whose strength is not otherwise specified in this subsection shall be capable of supporting a minimum fall impact load of 5,000 pounds (22.2 kN) applied at the lanyard point of connection.

(xiv) Dee-rings and snap-hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or taking permanent deformation.

(xv) Snap-hooks shall be a locking type snap-hook designed and used to prevent disengagement of the snap-hook by the contact of the snap-hook keeper by the connected member.

(xvi) Unless the snap-hook is designed for the following connections, snap-hooks shall not be engaged:

- (A) Directly to webbing, rope or wire rope;
- (B) To each other;
- (C) To a dee-ring to which another snap-hook or other connector is attached;

(D) To a horizontal lifeline; or

(E) To any object which is incompatibly shaped or dimensioned in relation to the snap-hook such that unintentional disengagement could occur by the connected object being able to depress the snap-hook keeper and release itself.

(xvii) Full body harness systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength have been adversely affected.

(b) Safety net systems. Safety net systems and their use shall comply with the following provisions:

(i) Safety nets shall be installed as close as practicable under the surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level unless specifically approved in writing by the manufacturer. The potential fall area to the net shall be unobstructed.

(ii) Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net	Minimum required horizontal distance of outer edge of net from the edge of the working surface
Up to 5 feet .....	8 feet
More than 5 feet up to 10 feet ...	10 feet
More than 10 feet .....	13 feet

(iii) Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test specified in (b)(iv) of this subsection.

(iv) Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop test specified in (b)(iv)(A) and (B) of this subsection.

(A) Except as provided in (b)(iv)(B) of this subsection, safety nets and safety net installations shall be drop-tested at the job site after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at 6-month intervals if left in one place. The drop-test shall consist of a 400 pound (180 kg) bag of sand 30 ± 2 inches (76 ± 5 cm) in diameter dropped into the net from the highest walking/working surface at which employees are exposed to fall hazards, but not from less than 42 inches (1.1 m) above that level.

(B) When the employer can demonstrate that it is unreasonable to perform the drop-test required by (b)(iv)(A) of this subsection, the employer (or a designated competent person) shall certify that the net and net installation is in compliance with the provisions of (b)(iii) and (b)(iv)(A) of this subsection by preparing a certification record prior to the net being used as a fall protection system. The certification record must include an identification of the net and net installation for which the certification record is being prepared; the date that it was determined that the identified net and net installation were in compliance with (b)(iii) of this subsection and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the job site for inspection.

(v) Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence which could affect the integrity of the safety net system.

(vi) Materials, scrap pieces, equipment, and tools which have fallen into the safety net shall be removed as soon as possible from the net and at least before the next work shift.

(vii) The maximum size of each safety net mesh opening shall not exceed 36 square inches (230 cm<sup>2</sup>) nor be longer than 6 inches (15 cm) on any side, and the opening, measured center-to-center of mesh ropes or webbing, shall not be longer than 6 inches (15 cm). All mesh crossings shall be secured to prevent enlargement of the mesh opening.

(viii) Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds (22.2 kN).

(ix) Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than 6 inches (15 cm) apart.

(c) Catch platforms.

(i) A catch platform shall be installed within 10 vertical feet of the work area.

(ii) The catch platforms width shall equal the distance of the fall but shall be a minimum of 45 inches wide and shall be equipped with standard guardrails on all open sides.

(3) Positioning device systems. Positioning device systems and their use shall conform to the following provisions:

(a) Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet (.61 m).

(b) Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.

(c) Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.

(d) Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.

(e) Connecting assemblies shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

(f) Dee-rings and snap-hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or taking permanent deformation.

(g) Snap-hooks shall be a locking type snap-hook designed and used to prevent disengagement of the snap-hook by the contact of the snap-hook keeper by the connected member.

(h) Unless the snap-hook is designed for the following connections, snap-hooks shall not be engaged:

(i) Directly to webbing, rope or wire rope;

(ii) To each other;

(iii) To a dee-ring to which another snap-hook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object which is incompatibly shaped or dimensioned in relation to the snap-hook such that unintentional disengagement could occur by the connected object being able to depress the snap-hook keeper and release itself.

(i) Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration, and defective components shall be removed from service.

(j) Body belts, harnesses, and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

(4) Droplines or lifelines used on rock scaling operations, or in areas where the lifeline may be subjected to cutting or abrasion, shall be a minimum of 7/8 inch wire core manila rope. For all other lifeline applications, a minimum of 3/4 inch manila or equivalent, with a minimum breaking strength of 5,000 pounds, shall be used.

(5) Safety harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used while performing the following types of work when other equivalent type protection is not provided:

(a) Work performed in permit required confined spaces and other confined spaces shall follow the procedures as described in chapter 296-62 WAC, Part M.

(b) Work on hazardous slopes, or dismantling safety nets, working on poles or from boatswains chairs at elevations greater than six feet (1.83 m), swinging scaffolds or other unguarded locations.

(c) Work on skips and platforms used in shafts by crews when the skip or cage does not occlude the opening to within one foot (30.5 cm) of the sides of the shaft, unless cages are provided.

(6) Canopies, when used as falling object protection, shall be strong enough to prevent collapse and to prevent penetration by any objects which may fall onto the canopy.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-24510, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24510, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24510, filed 4/25/95, effective 10/1/95; 95-04-007, § 296-155-24510, filed 1/18/95, effective 3/1/95; 93-19-142 (Order 93-04), § 296-155-24510, filed 9/22/93, effective 11/1/93; 91-24-017 (Order 91-07), § 296-155-24510, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24510, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-24515 Guarding of low pitched roof perimeters.** (1) General provisions. During the performance of work on low pitched roofs with a potential fall hazard greater than 10 feet, the employer shall ensure that employees engaged in such work be protected from falling from all unprotected sides and edges of the roof as follows:

(a) By the use of a fall restraint or fall arrest systems, as defined in WAC 296-155-24510; or

(b) By the use of a warning line system erected and maintained as provided in subsection (3) of this section and supplemented for employees working between the warning line and the roof edge by the use of a safety monitor system as described in WAC 296-155-24521.

(c) Mechanical equipment shall be used or stored only in areas where employees are protected by a warning line system, or fall restraint, or fall arrest systems as described in WAC 296-155-24510. Mechanical equipment may not be used or stored where the only protection is provided by the use of a safety monitor.

## (2) Exceptions.

(a) The provisions of subsection (1)(a) of this section do not apply at points of access such as stairways, ladders, and ramps, or when employees are on the roof only to inspect, investigate, or estimate roof level conditions. Roof edge materials handling areas and materials storage areas shall be guarded as provided in subsection (4) of this section.

(b) Employees engaged in roofing on low-pitched roofs less than 50 feet wide, may elect to use a safety monitor system without warning lines.

Note: See Appendix A to Part C-1—Determining roof widths nonmandatory guidelines for complying with WAC 296-155-24515 (2)(b).

## (3) Warning lines systems.

(a) Warning lines shall be erected around all sides of the work area.

(i) When mechanical equipment is not being used, the warning line shall be erected not less than six feet (1.8 meters) from the edge of the roof.

(ii) When mechanical equipment is being used, the warning line shall be erected not less than six feet (1.8 meters) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 meters) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

(b) The warning line shall consist of a rope, wire, or chain and supporting stanchions erected as follows:

(i) The rope, wire, or chain shall be flagged at not more than six foot (1.8 meter) intervals with high visibility material.

(ii) The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 36 inches (91.4 cm) from the roof surface and its highest point is no more than 42 inches (106.7 cm) from the roof surface.

(iii) After being erected, with the rope, wire or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 Newtons) applied horizontally against the stanchion, 30 inches (0.76 meters) above the roof surface, perpendicular to the warning line, and in the direction of the roof edge.

(iv) The rope, wire, or chain shall have a minimum tensile strength of 200 pounds (90 kilograms), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions.

(v) The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

(c) Access paths shall be erected as follows:

(i) Points of access, materials handling areas, and storage areas shall be connected to the work area by a clear access path formed by two warning lines.

(ii) When the path to a point of access is not in use, a rope, wire, or chain, equal in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area.

(4) Roof edge materials handling areas and materials storage. Employees working in a roof edge materials handling or materials storage area located on a low pitched roof with a ground to eave height greater than 10 feet shall be pro-

tected from falling along all unprotected roof sides and edges of the area.

(a) When guardrails are used at hoisting areas, a minimum of four feet of guardrail shall be erected on each side of the access point through which materials are hoisted.

(b) A chain or gate shall be placed across the opening between the guardrail sections when hoisting operations are not taking place.

(c) When guardrails are used at bitumen pipe outlet, a minimum of four feet of guardrail shall be erected on each side of the pipe.

(d) When safety belt/harness systems are used, they shall not be attached to the hoist.

(e) When fall restraint systems are used, they shall be rigged to allow the movement of employees only as far as the roof edge.

(f) Materials shall not be stored within six feet of the roof edge unless guardrails are erected at the roof edge.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-24515, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-24515, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24515, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-24515, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24515, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-24519 Reserve.**

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-24519, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24519, filed 4/25/95, effective 10/1/95.]

**WAC 296-155-24520 Leading edge control zone. (1)**

When performing leading edge work, the employer shall ensure that a control zone be established according to the following requirements:

(a) The control zone shall begin a minimum of 6 feet back from the leading edge to prevent exposure by employees who are not protected by fall restraint or fall arrest systems.

(b) The control zone shall be separated from other areas of the low pitched roof or walking/working surface by the erection of a warning line system.

(c) The warning line system shall consist of wire, rope, or chain supported on stanchions, or a method which provides equivalent protection.

(d) The spacing of the stanchions and support of the line shall be such that the lowest point of the line (including sag) is not less than 36 inches from the walking/working surface, and its highest point is not more than 42 inches (106.7 cm) from the walking/working surface.

(e) Each line shall have a minimum tensile strength of 200 pounds (90 kilograms).

(f) Each line shall be flagged or clearly marked with high visibility materials at intervals not to exceed 6 feet.

(g) After being erected with the rope, or chain attached, stanchions shall be capable of resisting without tipping over, a force of at least 16 pounds (71 Newtons) applied horizontally against the stanchions 30 inches (0.76 meters) above the roof surface, perpendicular to the warning line and in the direction of the roof edge.

(2) When positive means of fall restraint as described in WAC 296-155-24510 (1)(a) through (d), or fall arrest as described in WAC 296-155-24510 (2) through (6) are not utilized, a safety monitor system as described in WAC 296-155-24521 shall be implemented to protect employees working between the forward edge of the warning line and the leading edge.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-24520, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24520, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24520, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-24520, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24520, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-24521 Safety monitor system.** (1) A safety monitor system (SMS) may be used in conjunction with a warning line system as a method of guarding against falls during work on low pitched roofs and leading edge work only.

(2) When selected, the employer shall ensure that the safety monitor system shall be addressed in the fall protection work plan, include the name of the safety monitor(s) and the extent of their training in both the safety monitor and warning line systems, and shall ensure that the following requirements are met.

(3) The safety monitor system shall not be used when adverse weather conditions create additional hazards.

(4) A person acting in the capacity of safety monitor(s) shall be trained in the function of both the safety monitor and warning lines systems, and shall:

(a) Be a competent person as defined in WAC 296-155-24503.

(b) Have control authority over the work as it relates to fall protection.

(c) Be instantly distinguishable over members of the work crew.

(d) Engage in no other duties while acting as safety monitor.

(e) Be positioned in relation to the workers under their protection, so as to have a clear, unobstructed view and be able to maintain normal voice communication.

(f) Not supervise more than eight exposed workers at one time.

(g) Warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner.

(5) Control zone:

(a) Workers shall be distinguished from other members of the crew by wearing highly visible, distinctive, and uniform apparel readily distinguishing them from other members of the crew only while in the control zone.

(b) The employer shall ensure that each employee working in a control zone promptly comply with fall hazard warnings from safety monitors.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-24521, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24521, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24521, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24521, filed 1/10/91, effective 2/12/91.]

### WAC 296-155-24522 Reserve.

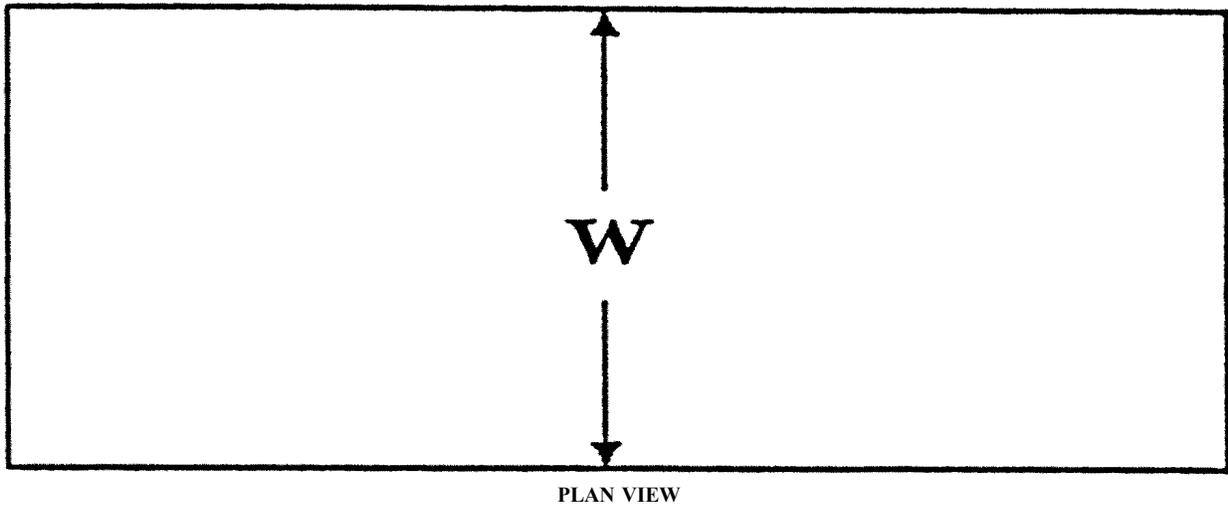
[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24522, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24522, filed 4/25/95, effective 10/1/95.]

**WAC 296-155-24523 Appendix A to Part C-1—Determining roof widths nonmandatory guidelines for complying with WAC 296-155-24515 (2)(b).** (1) This appendix serves as a guideline to assist employers complying with the requirements of WAC 296-155-24515 (2)(b). WAC 296-155-24515 (2)(b) allows the use of a safety monitoring system alone as a means of providing fall protection during the performance of roofing operations on low-sloped roofs 50 feet (15.25 m) or less in width. Each example in the appendix shows a roof plan or plans and indicates where each roof or roof area is to be measured to determine its width. Section views or elevation views are shown where appropriate. Some examples show "correct" and "incorrect" subdivisions of irregularly shaped roofs divided into smaller, regularly shaped areas. In all examples, the dimension selected to be the width of an area is the lesser of the two primary dimensions of the area, as viewed from above. Example A shows that on a simple rectangular roof, width is the lesser of the two primary overall dimensions. This is also the case with roofs which are sloped toward or away from the roof center, as shown in Example B.

(2) Many roofs are not simple rectangles. Such roofs may be broken down into subareas as shown in Example C. The process of dividing a roof area can produce many different configurations. Example C gives the general rule of using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than 50 feet (15.25 m) wide. The intent is to minimize the number of roof areas where safety monitoring systems alone are sufficient protection.

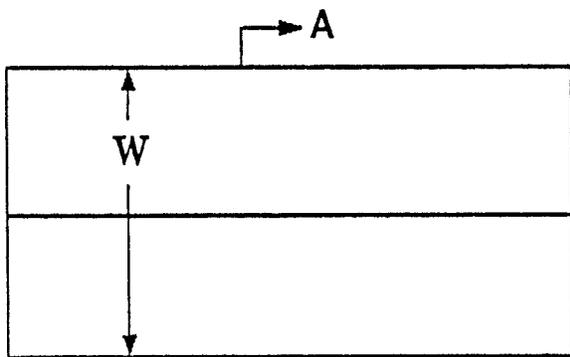
(3) Roofs which are comprised of several separate, non-contiguous roof areas, as in Example D, may be considered as a series of individual roofs. Some roofs have penthouses, additional floors, courtyard openings, or similar architectural features; Example E shows how the rule for dividing roofs into subareas is applied to such configurations. Irregular, non-rectangular roofs must be considered on an individual basis, as shown in Example F.

Example A  
*Rectangular Shaped Roof*

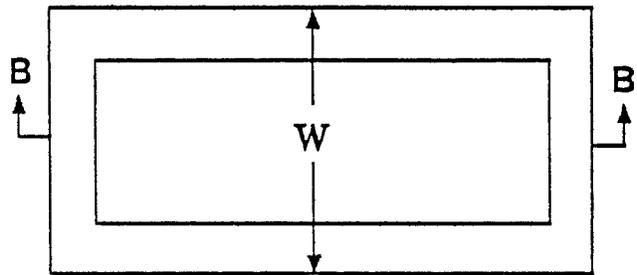


PLAN VIEW

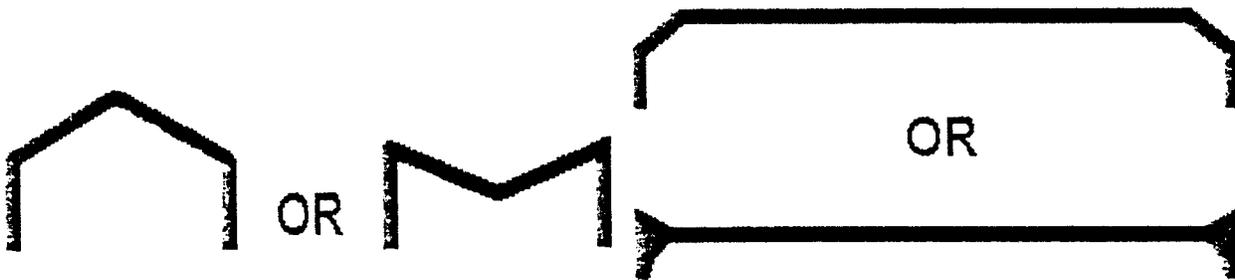
Example B  
*Sloped Rectangular Shaped Roofs*



PLAN VIEW



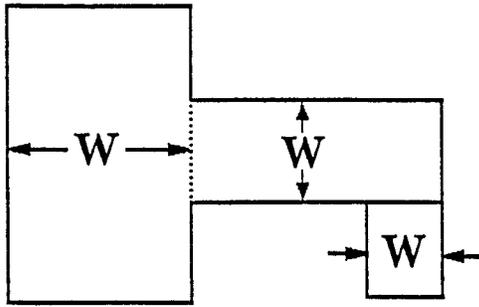
PLAN VIEW



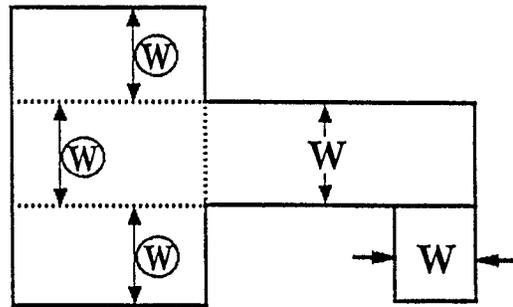
SECTION A-A

SECTION B-B

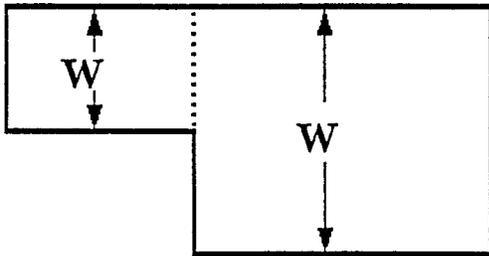
Example C  
Irregularly Shaped Roofs With Rectangular Shaped Sections



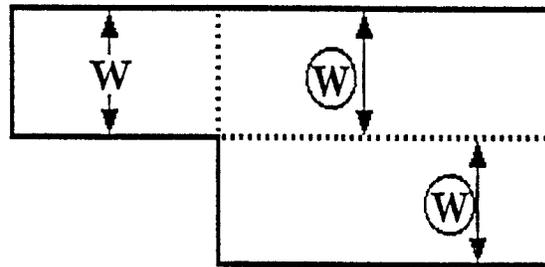
Correct



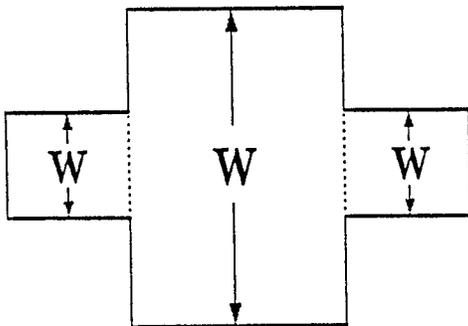
Incorrect



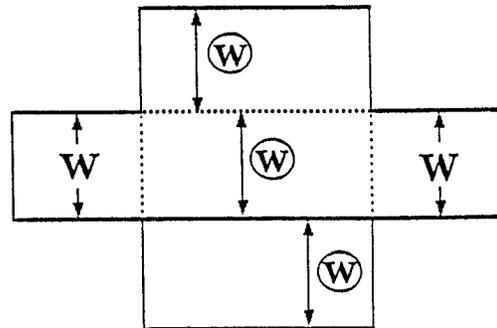
Correct



Incorrect



Correct

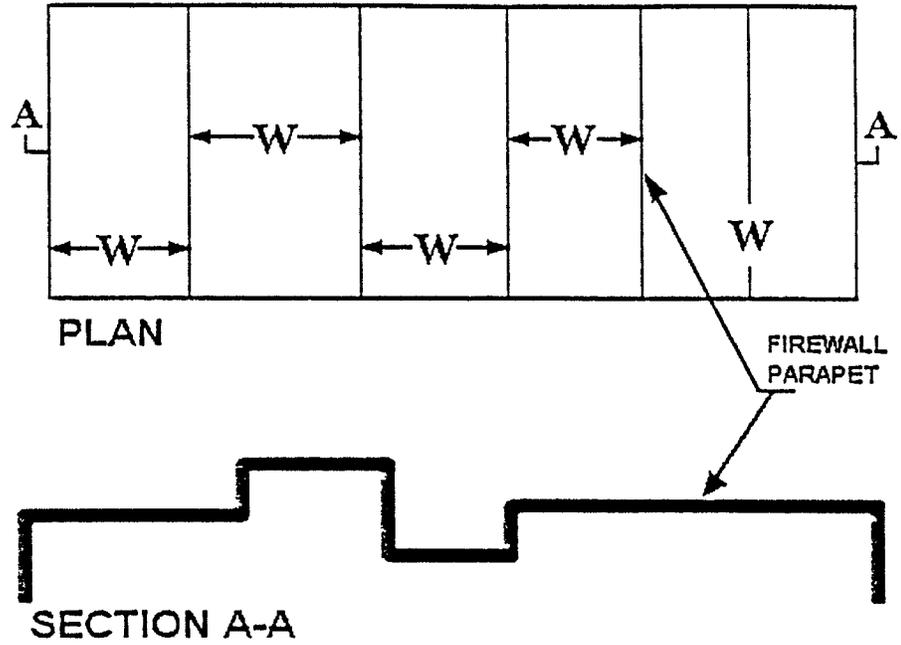


Incorrect

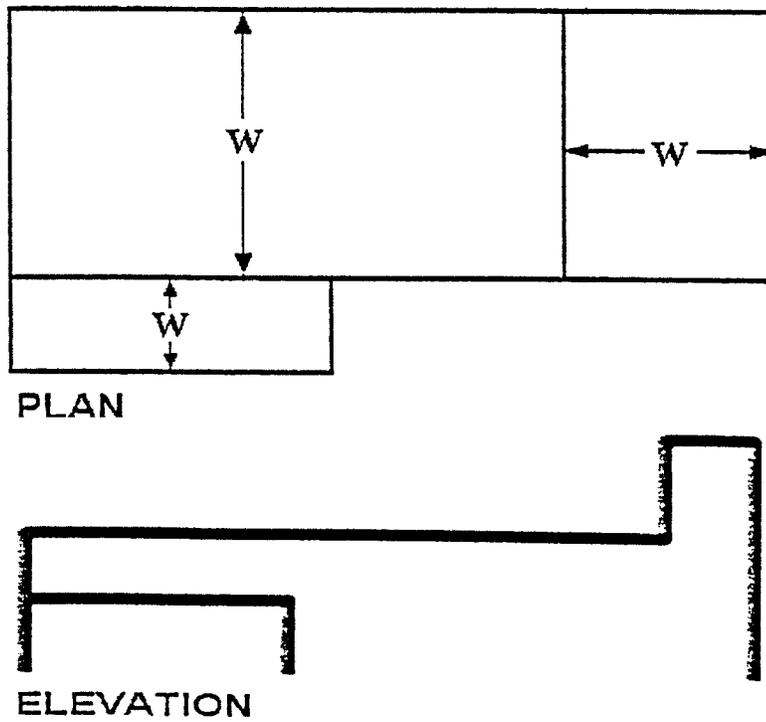
Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 m) in width, in order to limit the size of roof areas where the safety monitoring system alone can be used (WAC 296-155-24515 (2)(b)). Dotted lines are used in the examples to show the location of dividing lines, (W) denotes incorrect measurements of width.

Example D  
*Separate, NonContiguous Roof Areas*

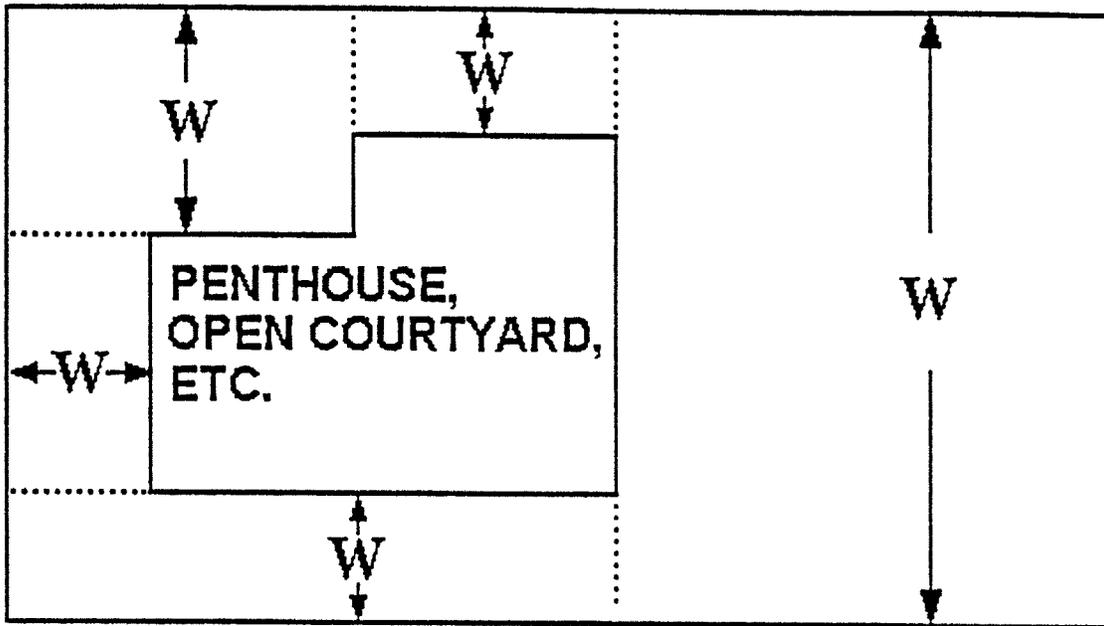
1.



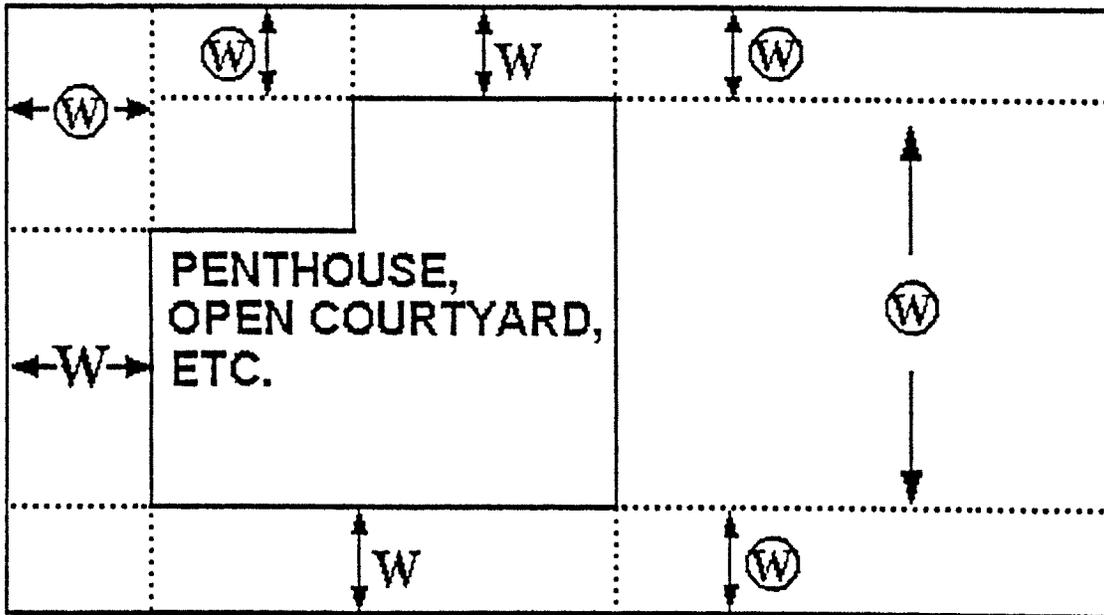
2.



Example E  
*Roofs with Penthouses, Open Courtyards, Additional Floors, etc.*

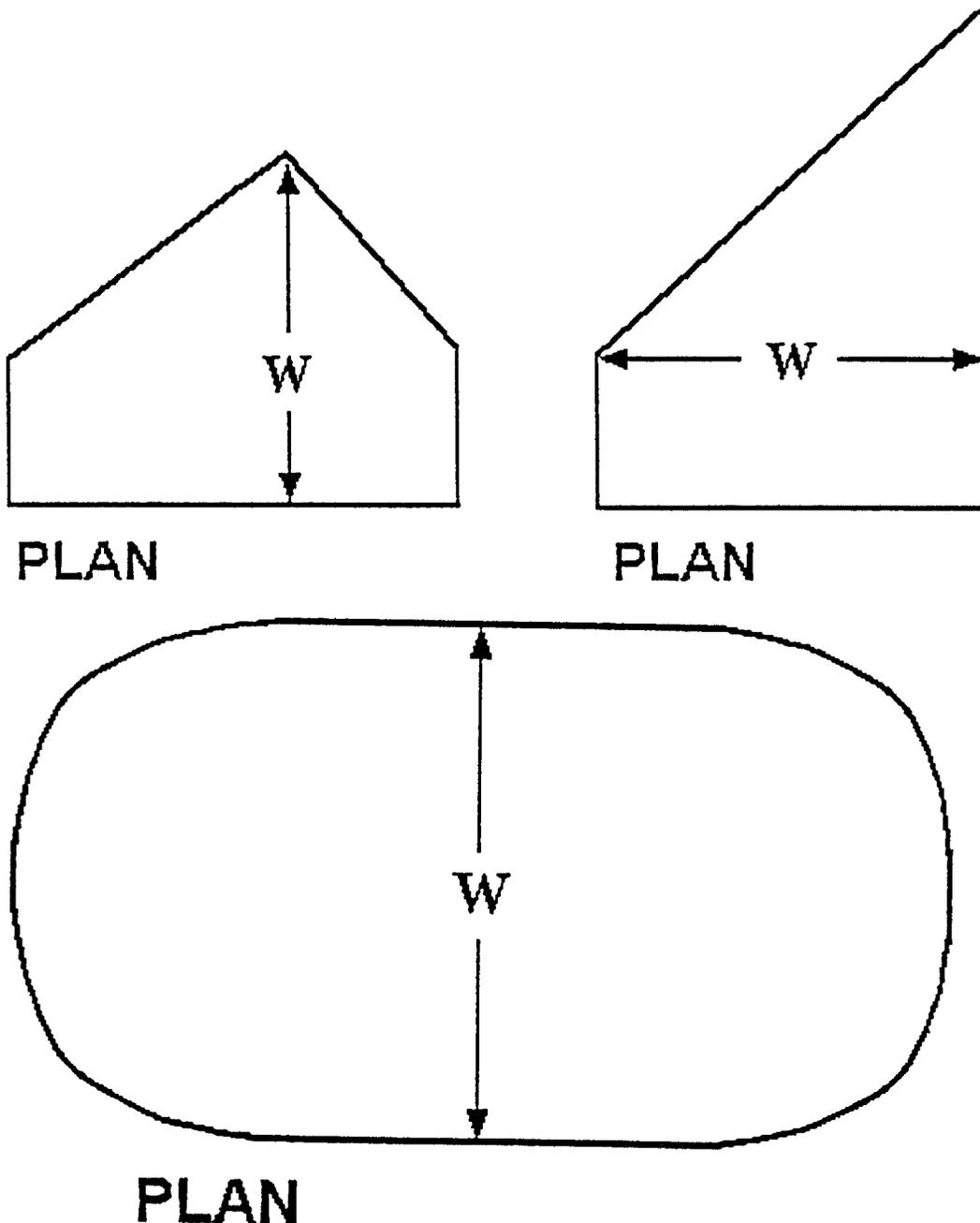


**CORRECT**



**INCORRECT**

**Example F**  
*Irregular, NonRectangular Shaped Roofs*



[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24523, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24523, filed 4/25/95, effective 10/1/95.]

**WAC 296-155-24524 Reserve.**

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24524, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24524, filed 4/25/95, effective 10/1/95.]

**WAC 296-155-24525 Appendix B to Part C-1—Fall restraint and fall arrest (employer information only).**

Additional standards that require the use of fall restraint and/or fall arrest protection for employees are listed below:

Ladders	WAC 296-155-480 (1)(r) WAC 296-155-480 (1)(s)
Scaffolds	WAC 296-155-483(7)
Boom Supported Elevating Work Platforms	WAC 296-155-489
Vehicle Mounted Elevated and Rotating Work Platforms	WAC 296-155-490 (2)(b)(v)

Crane and Derrick Supported Work Platforms	WAC 296-155-528 (6)(c) WAC 296-155-528 (6)(d) WAC 296-155-528 (7)(i) WAC 296-155-528 (7)(j) WAC 296-155-528 (7)(k) WAC 296-155-528 (10)(h)
Open Sided Floors	WAC 296-155-505 (6)(a) through (f)
Pile Driving	WAC 296-155-620 (1)(i)
Vertical Slip Forms	WAC 296-155-688(9)
Placing and Removal of Forms	WAC 296-155-689(4)
Steel Erection Temporary Floors	WAC 296-155-705 (2)(b)

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, 02-12-098, § 296-155-24525, filed 6/5/02, effective 8/1/02; 00-14-058, § 296-155-24525, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060, 98-05-046, § 296-155-24525, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060, 96-24-051, § 296-155-24525, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW, 95-10-016, § 296-155-24525, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24525, filed 1/10/91, effective 2/12/91.]

## PART D FIRE PROTECTION AND PREVENTION

### WAC 296-155-250 Definitions applicable to this part.

(1) "Approved" for the purpose of this part, means equipment that has been listed or approved by a nationally recognized testing laboratory such as Factory Mutual Engineering Corp., or Underwriters' Laboratories, Inc., federal agencies such as United States Mine Safety and Health Administration or United States Coast Guard, which issue approvals for such equipment, or the department of labor and industries.

(2) "Closed container" means a container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

(3) "Combustible liquid" means any liquid having a flashpoint at or above 100°F (37.8°C). Combustible liquids shall be divided into two classes as follows:

(a) "Class II liquids" shall include those with flashpoints at or above 100°F (37.8°C) and below 140°F (60°C), except any mixture having components with flashpoints of 200°F (93.3°C) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.

(b) "Class III liquids" shall include those with flashpoints at or above 140°F (60°C). Class III liquids are subdivided into two subclasses:

(i) "Class IIIA liquids" shall include those with flashpoints at or above 140°F (60°C) and below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

(ii) "Class IIIB liquids" shall include those with flashpoints at or above 200°F (93.3°C). This section does not cover Class IIIB liquids. Where the term "Class III liquids" is used in this section, it shall mean only Class IIIA liquids.

(c) When a combustible liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for the next lower class of liquids.

(4) "Combustion" means any chemical process that involves oxidation sufficient to produce light or heat.

(5) "Fire brigade" means an organized group of employees that are knowledgeable, trained, and skilled in the safe evacuation of employees during emergency situations and in assisting in fire fighting operations.

(6) "Fire resistance" means so resistant to fire that, for specified time and under conditions of a standard heat intensity, it will not fail structurally and will not permit the side away from the fire to become hotter than a specified temperature. For purposes of this part, fire resistance shall be determined by the Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-72.

(7) "Flammable" means capable of being easily ignited, burning intensely or having a rapid rate of flame spread.

(8) "Flammable liquid" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids. Class I liquids are divided into three classes as follows:

(a) Class IA shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

(b) Class IB shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).

(c) Class IC shall include liquids having flashpoints at or above 73°F (22.8°C) and below 100°F (37.8°C).

(9) "Flashpoint" means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, and shall be determined as follows:

(a) For a liquid which has a viscosity of less than 45 SUS at 100°F (37.8°C), does not contain suspended solids, and does not have a tendency to form a surface film while under test, the procedure specified in the Standard Method of Test for Flashpoint by Tag Closed Tester (ASTM D-56-70) shall be used.

(b) For a liquid which has a viscosity of 45 SUS or more at 100°F (37.8°C), or contains suspended solids, or has a tendency to form a surface film while under test, the Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester (ASTM D-93-71) shall be used, except that the methods specified in Note 1 to section 1.1 of ASTM D-93-71 may be used for the respective materials specified in the note.

(10) "Liquified petroleum gases" "LPG" and "LP Gas" mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them, such as propane, propylene, butane (normal butane or isobutane), and butylenes.

(11) "Portable tank" means a closed container having a liquid capacity more than 60 U.S. gallons, and not intended for fixed installation.

(12) "Safety can" means an approved closed container, of not more than 5 gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

(13) "Salamander" means a portable heating device, solid or liquid fueled, which is not vented to the outdoor atmosphere.

(14) "Vapor pressure" means the pressure, measured in pounds per square inch (absolute), exerted by a volatile liquid as determined by the "Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)," (ASTM D-323-68).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-250, filed 1/21/86; Order 74-26, § 296-155-250, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-260 Fire protection.** (1) General requirements.

(a) The employer shall be responsible for development of a fire protection program to be followed throughout all phases of construction and demolition work, and the employer shall provide for fire fighting equipment as specified in this part. As fire hazards occur, there shall be no delay in providing necessary equipment.

(b) Access to all available fire fighting equipment shall be maintained at all times.

(c) All fire fighting equipment, provided by the employer, shall be conspicuously located.

(d) All fire fighting equipment shall be periodically inspected by a competent person, and maintained in operating condition. Defective equipment shall be immediately replaced.

(e) As warranted by the project, the employer shall provide a trained and equipped fire fighting organization (fire brigade) to assure adequate protection to life.

(2) Water supply.

(a) A temporary or permanent water supply, of sufficient volume, duration, and pressure, required to properly operate fire fighting equipment shall be made available as soon as combustible materials accumulate.

(b) Where underground water mains are to be provided, they shall be installed, completed, and made available for use as soon as practicable.

(3) Portable fire fighting equipment.

(a) A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of a combustible building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed a horizontal distance of 100 feet.

Note: One 55-gallon open drum of water with two fire pails may be substituted for a fire extinguisher having a 2A rating.

(b) A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, provided it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be applied to all points in the area.

(c) One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, where combustibles are present, at least one fire extinguisher shall be located adjacent to a stairway.

(d) Extinguishers and water drums, subject to freezing, shall be protected from freezing.

(e) A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of

flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.

(f) Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

(g) Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1981 and WAC 296-800-300.

(h) Fire extinguishers which have been listed or approved by a nationally recognized testing laboratory, shall be used to meet the requirements of this part. (See Table D-1)

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
	 SODIUM BICARBONATE	 CARBON DIOXIDE	 WATER PUMP TYPE	 SODA ACID			SODIUM OR POTASSIUM BICARBONATE		MULTI-PURPOSE ABC	
							 CARTRIDGE OPERATED	 STORED PRESSURE	 STORED PRESSURE	 CARTRIDGE OPERATED
<b>CLASS A FIRES</b> WOOD, PAPER, RUBBER, LEAVING REMAINING FINISHES	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES
<b>CLASS B FIRES</b> LIQUID BURNING FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC.	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
<b>CLASS C FIRES</b> ELECTRICAL EQUIPMENT	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
<b>CLASS D FIRES</b> COMBUSTIBLE METALS	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES									
METHODS OF OPERATION	PULL PIN, SQUEEZE LEVER	TURN TOP/NOZZLE DOWN AND PUMP	PUMP HANDLE	TURN TOPSIDE DOWN	TURN TOPSIDE DOWN	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
MAINTENANCE	CHECK AIR PRESSURE GAGE MONTHLY	WASH CAN CARTRIDGE WITH WATER IF EXHAUSTED ANNUALLY	RECHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	WASH CAN ANNUALLY	WASH CAN CARTRIDGE CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WASH CAN CARTRIDGE CHECK CONDITION OF DRY CHEMICAL ANNUALLY

Note: One hundred feet, or less, of 1-1/2 inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute, may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

(i) If fire hose connections are not compatible with local fire fighting equipment, the contractor shall provide adapters, or equivalent, to permit connections.

(j) During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.

(4) Fixed fire fighting equipment.

(a) Sprinkler protection.

(i) If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.

(ii) During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly authorized persons.

Note: Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at close of work to ascertain that the protection is in service.

(b) Standpipes. In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as applicable laws permit, and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use. The standpipes shall be provided with Siamese fire department connections on the outside of the structure, at the street level, which shall be conspicuously marked. There shall be at least one standard hose outlet at each floor.

(5) Fire alarm devices.

(a) An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

(b) The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

(6) Fire cutoffs.

(a) Fire walls and exit stairways, required for the completed buildings, shall be given construction priority. Fire doors, with automatic closing devices, shall be hung on openings as soon as practical.

(b) Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-155-260, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-155-260, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-260, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-260, filed 1/21/86; Order 76-6, § 296-155-260, filed 3/1/76; Order 74-26, § 296-155-260, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-265 Fire prevention.** (1) Ignition hazards.

(a) Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with the requirements of Part I of this standard.

(b) Internal combustion engine powered equipment shall be so located that exhausts are well away from combustible materials. When exhausts are piped to outside the building

under construction, a clearance of at least 6 inches shall be maintained between such piping and combustible material.

(c) Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No smoking or open flame."

(d) Portable battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, shall be of the type approved for the hazardous locations.

(e) The nozzle of air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall not be attached or detached in hazardous concentrations of flammable gases or vapors.

(f) Workers shall not take open lights or open flames near or in an open sewer manhole, gas main, conduit or other similar place until the absence of explosive or harmful gases has been assured. Open lights or flames shall not be carried into areas and enclosures where flammable vapors or exposed low flash point solvents exist. Only approved and suitable protected lights shall be used.

(2) Temporary buildings.

(a) No temporary building shall be erected where it will adversely affect any means of exit.

(b) Temporary buildings, when located within another building or structure, shall be of either noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour.

(c) Temporary buildings, located other than inside another building and not used for the storage, handling, or use of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, shall be located at a distance of not less than 10 feet from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet in aggregate, shall, for the purpose of this part, be considered a single temporary building.

(3) Open yard storage.

(a) Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.

(b) Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.

(c) The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.

(d) When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.

(e) Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.

(f) Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A, shall be placed so that maximum travel distance to the nearest unit shall not exceed 100 feet.

(4) Indoor storage.

(a) Storage shall not obstruct, or adversely affect, means of exit.

(b) All materials shall be stored, handled, and piled with due regard to their fire characteristics.

(c) Noncompatible materials, which may create a fire hazard, shall be segregated by a barrier having a fire resistance of at least 1 hour.

(d) Material shall be piled to minimize the spread of fire internally and to permit convenient access for firefighting. Stable piling shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for fire fighting purposes.

(e) Clearance of at least 36 inches shall be maintained between the top level of the stored material and the sprinkler deflectors.

(f) Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.

(g) A clearance of 24 inches shall be maintained around the path of travel of fire doors unless a barricade is provided, in which case no clearance is needed. Material shall not be stored within 36 inches of a fire door opening.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-265, filed 11/14/88; Order 74-26, § 296-155-265, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-270 Flammable and combustible liquids.** (1) General requirements.

(a) Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved metal safety cans, or department of transportation approved containers shall be used for the handling and use of flammable liquids in quantities five gallons or less, except that this shall not apply to those flammable liquid materials which are highly viscid (extremely hard to pour), which may be used and handled in original shipping containers. For quantities of one gallon or less, only the original container may be used for storage, use, and handling of flammable liquids.

(b) Flammable or combustible liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of people.

(c) Flammable and combustible liquid containers shall be legibly marked to indicate their contents. Each storage container for flammable or combustible liquids, with a capacity of 50 gallons or more, shall have the contents of the container identified by a sign of clearly visible contrasting colors with letters at least 3 inches high, painted on the container at the discharge valve and at the fill point.

(d) Gasoline shall not be used as a solvent or a cleaning agent.

(2) Indoor storage of flammable and combustible liquids.

(a) No more than 25 gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet. For storage of liquid petroleum gas, see WAC 296-155-275.

(b) Quantities of flammable and combustible liquid in excess of 25 gallons shall be stored in an acceptable or approved cabinet meeting the following requirements:

(i) Acceptable wooden storage cabinets shall be constructed in the following manner, or equivalent: The bottom, sides, and top shall be constructed of an exterior grade of plywood at least 1 inch in thickness, which shall not break down or delaminate under standard fire test conditions. All joints shall be rabbeted and shall be fastened in two directions with flathead wood screws, when more than one door is used, there shall be a rabbeted overlap of not less than 1 inch. Steel hinges shall be mounted in such a manner as to not lose their holding capacity due to loosening or burning out of the screws when subjected to fire. Such cabinets shall be painted inside and out with fire retardant paint.

(ii) Approved metal storage cabinets will be acceptable.

(iii) Cabinets shall be labeled in conspicuous lettering, "Flammable—Keep fire away."

(c) Not more than 60 gallons of flammable or 120 gallons of combustible liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

(d)(i) Inside storage room shall be constructed to meet the required fire-resistive rating for their use. Such construction shall comply with the test specifications set forth in Standard Methods of Fire Test of Building Construction and Material, NFPA 251-1972.

(ii) Where an automatic extinguishing system is provided, the system shall be designed and installed in an approved manner. Openings to other rooms or buildings shall be provided with noncombustible liquid-tight raised sills or ramps at least 4 inches in height, or the floor in the storage area shall be at least 4 inches below the surrounding floor. Openings shall be provided with approved self-closing fire doors. The room shall be liquid-tight where the walls join the floor. A permissible alternate to the sill or ramp is an open-grated trench, inside of the room, which drains to a safe location. Where other portions of the building or other buildings are exposed, windows shall be protected as set forth in the Standard for Fire Doors and Windows, NFPA No. 80-1983, for Class E or F openings. Wood of at least 1-inch nominal thickness may be used for shelving, racks, dunnage, scuffboards, floor overlay and similar installations.

(iii) Materials which will react with water and create a fire hazard shall not be stored in the same room with flammable or combustible liquids.

(iv) Storage in inside storage rooms shall comply with Table D-2 following:

TABLE D-2

Fire protection provided	Fire resistance	Maximum size	Total allowable quantities gals./sq. ft./floor area
Yes	2 hrs.	500 sq. ft.	10
No	2 hrs.	500 sq. ft.	4
Yes	1 hr.	150 sq. ft.	5
No	1 hr.	150 sq. ft.	2

Note: Fire protection system shall be sprinkler, water spray, carbon dioxide or other system approved by a nationally recognized testing laboratory for this purpose.

(v) Electrical wiring and equipment located in inside storage rooms shall be approved for Class 1, Division 1, haz-

ardous locations. For definition of Class 1, Division 1, hazardous locations, see WAC 296-155-456.

(vi) Every inside storage room shall be provided with either a gravity or a mechanical exhausting system. Such system shall commence not more than 12 inches above the floor and be designed to provide for a complete change of air within the room at least 6 times per hour. If a mechanical exhausting system is used, it shall be controlled by a switch located outside of the door. The ventilating equipment and any lighting fixtures shall be operated by the same switch. An electric pilot light shall be installed adjacent to the switch if flammable liquids are dispensed within the room. Where gravity ventilation is provided, the fresh air intake, as well as the exhausting outlet from the room, shall be on the exterior of the building in which the room is located.

(vii) In every inside storage room there shall be maintained one clear aisle at least 3 feet wide. Containers over 30 gallons capacity shall not be stacked one upon the other.

(viii) Flammable and combustible liquids in excess of that permitted in inside storage rooms shall be stored outside of buildings in accordance with subsection (3) of this section.

(3) Storage outside buildings.

(a) Storage of containers (not more than 60 gallons each) shall not exceed 1,100 gallons in any one pile or area. Piles or groups of containers shall be separated by a 5-foot clearance. Piles or groups of containers shall not be nearer than 20 feet to a building.

(b) Within 200 feet of each pile of containers, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(c) The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures, or shall be surrounded by a curb or earth dike at least 12 inches high. When curbs or dikes are used, provisions shall be made for draining off accumulations of ground or rain water, or spills of flammable or combustible liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.

(d) Outdoor portable tank storage.

(i) Portable tanks shall not be nearer than 20 feet from any building. Two or more portable tanks, grouped together, having a combined capacity in excess of 2,200 gallons, shall be separated by a 5-foot-clear area. Individual portable tanks exceeding 1,100 gallons shall be separated by a 5-foot-clear area.

(ii) Within 200 feet of each portable tank, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(e) Storage areas shall be kept free of weeds, debris, and other combustible material not necessary to the storage.

(f) Portable tanks, not exceeding 660 gallons, shall be provided with emergency venting and other devices, as required by chapters III and IV of NFPA 30-1972, The Flammable and Combustible Liquids Code.

(g) Portable tanks, in excess of 660 gallons, shall have emergency venting and other devices, as required by chapters II and III of the Flammable and Combustible Liquids Code, NFPA 30-1972.

(4) Fire control for flammable or combustible liquid storage.

(a) At least one portable fire extinguisher, having a rating of not less than 20-B units, shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.

(b) At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

(c) When sprinklers are provided, they shall be installed in accordance with the Standard for the Installation of Sprinkler Systems, NFPA 13-1972.

(d) At least one portable fire extinguisher having a rating of not less than 20-B:C units shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable or combustible liquids.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

(5) Dispensing liquids.

(a) Areas in which flammable or combustible liquids are transferred at the same time, in quantities greater than 5 gallons from one tank or container to another tank or container, shall be separated from other operations by 25-foot distance or by construction having a fire-resistance of at least 1 hour. Drainage or other means shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.

(b) Transfer flammable liquids from one container to another shall be done only when containers are electrically interconnected (bonded).

(c) Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or tanks within a building or outside only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self-closing valve. Transferring by means of air pressure on the container or portable tank is prohibited.

(d) The dispensing units shall be protected against collision damage.

(e) Dispensing devices and nozzles for flammable liquids shall be of an approved type, as required by WAC 296-24-33015.

(6) Handling liquids at point of final use.

(a) Flammable liquids shall be kept in closed containers when not actually in use.

(b) Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely.

(c) Flammable liquids shall be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.

(7) Service and refueling areas.

(a) Flammable or combustible liquids shall be stored in approved closed containers, in tanks located underground, or in aboveground portable tanks.

(b) The tank trucks shall comply with the requirements covered in the Standard for Tank Vehicles for Flammable and Combustible Liquids, NFPA No. 385-1977.

(c) The dispensing hose shall be an approved type.

(d) The dispensing nozzle shall be an approved automatic-closing type.

(e) Underground tanks shall not be abandoned.

(f) Clearly identified and easily accessible switch(es) shall be provided at a location remote from dispensing devices to shut off the power to all dispensing devices in the event of an emergency.

(g)(i) Heating equipment of an approved type may be installed in the lubrication or service area where there is no dispensing or transferring of flammable liquids, provided the bottom of the heating unit is at least 18 inches above the floor and is protected from physical damage.

(ii) Heating equipment installed in lubrication or service areas, where flammable liquids are dispensed, shall be of an approved type for garages, and shall be installed at least 8 feet above the floor.

(h) There shall be no smoking or open flames in the areas used for fueling, servicing fuel systems for internal combustion engines, receiving or dispensing of flammable or combustible liquids.

(i) Conspicuous and legible signs prohibiting smoking shall be posted.

(j) The motor of any equipment being fueled shall be shut off during the fueling operation.

(k) Each service or fueling area shall be provided with at least one fire extinguisher having a rating of not less than 20BC located so that an extinguisher will be within 75 feet of each pump, dispenser, underground fill pipe opening, and lubrication or service area.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-155-270, filed 8/8/01, effective 9/1/01; 99-17-094, § 296-155-270, filed 8/17/99, effective 12/1/99. Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-270, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-270, filed 1/21/86; Order 74-26, § 296-155-270, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-275 Liquefied petroleum gas (LP-gas).** (1) Approval of equipment and systems.

(a) Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.

(b) All cylinders shall meet the department of transportation specification identification requirements published in 49 CFR Part 178, Shipping Container Specifications.

(2) Welding on LP-gas containers. Welding is prohibited on containers.

(3) Container valves and container accessories.

(a) Valves, fittings, and accessories connected directly to the container, including primary shut off valves, shall have a rated working pressure of at least 250 p.s.i.g. and shall be of material and design suitable for LP-gas service.

(b) Connections to containers, except safety relief connections, liquid level gauging devices, and plugged openings, shall have shutoff valves located as close to the container as practicable.

(4) Safety devices.

(a) Every container and every vaporizer shall be provided with one or more approved safety relief valves or

devices. These valves shall be arranged to afford free vent to the outer air with discharge not less than 5 feet horizontally away from any opening into a building which is below such discharge.

(b) Shutoff valves shall not be installed between the safety relief device and the container, or the equipment or piping to which the safety relief device is connected, except that a shutoff valve may be used where the arrangement of this valve is such that full required capacity flow through the safety relief device is always afforded.

(c) Container safety relief devices and regulator relief vents shall be located not less than 5 feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(5) Dispensing.

(a) Filling of fuel containers for trucks or motor vehicles from bulk storage containers shall be performed not less than 10 feet from the nearest masonry-walled building, or not less than 25 feet from the nearest building or other construction and, in any event, not less than 25 feet from any building opening.

(b) Filling of portable containers or containers mounted on skids from storage containers shall be performed not less than 50 feet from the nearest building.

(6) Requirements for appliances.

(a) LP-gas consuming appliances shall be approved types.

(b) Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-gas, and is in good condition, may be used with LP-gas only after it is properly converted, adapted, and tested for performance with LP-gas before the appliance is placed in use.

(7) Containers and regulating equipment installed outside of buildings or structures. Containers shall be upright upon firm foundations or otherwise firmly secured. The possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(8) Containers and equipment used inside of buildings or structures.

(a) When operational requirements make portable use of containers necessary, and their location outside of buildings or structures is impractical, containers and equipment are permitted to be used inside of buildings or structures in accordance with (b) through (k) of this subsection. In addition, there may be provisions of this section that are applicable to the particular use or occupancy.

(b) "Containers in use" means connected for use.

(c) Systems utilizing containers having a water capacity greater than 2 1/2 pounds (nominal 1 pound LP-gas capacity) shall be equipped with excess flow valves. Such excess flow valves shall be either integral with the container valves or in the connections to the container valve outlets.

(d) Regulators, when required, shall be either directly connected to the container valves or to manifolds connected to the container valves. The regulator shall be suitable for use with LP-gas. Manifolds and fittings connecting containers to pressure regulator inlets shall be designed for at least 250 p.s.i.g. service pressure.

(e) Valves on containers having water capacity greater than 50 pounds (nominal 20 pounds LP-gas capacity) shall be protected from damage while in use or storage.

(f) Aluminum piping or tubing shall not be used.

(g) Hose shall be designed for a working pressure of at least 250 p.s.i.g. Design, construction, and performance of hose, and hose connections shall have their suitability determined by listing by a nationally recognized testing agency. The hose length shall be as short as practical. Hoses shall be long enough to permit compliance with spacing provisions of (a) through (m) of this subsection, without kinking or straining, or causing hose to be so close to a burner as to be damaged by heat.

(h) Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the mainburner, and pilot if used, in the event of flame failure. Such heaters, having inputs above 50,000 BTU per hour, shall be equipped with either a pilot, which must be lighted and proved before the main burner can be turned on, or an electrical ignition system.

Note: The provisions of this subdivision do not apply to portable heaters under 7,500 BTU per hour input when used with containers having a maximum water capacity of 2 1/2 pounds.

(i) Container valves, connectors, regulators, manifolds, piping, and tubing shall not be used as structural supports for heaters.

(j) Containers, regulating equipment, manifolds, pipe, tubing, and hose shall be located to minimize exposure to high temperatures or physical damage.

(k) Containers having a water capacity greater than 2 1/2 pounds (nominal 1 pound LP-gas capacity) connected for use shall stand on a firm and substantially level surface and, when necessary, shall be secured in an upright position.

(l) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds LP-gas capacity).

(m) For temporary heating, heaters (other than integral heater-container units) shall be located at least 6 feet from any LP-gas container. This shall not prohibit the use of heaters specifically designed for attachment to the container or to a supporting standard, provided they are designed and installed so as to prevent direct or radiant heat application from the heater onto the containers. Blower and radiant type heaters shall not be directed toward any LP-gas container within 20 feet.

(n) If two or more heater-container units, of either the integral or nonintegral type, are located in an unpartitioned area on the same floor, the container or containers of each unit shall be separated from the container or containers of any other unit by at least 20 feet.

(o) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers, manifolded together for connection to a heater or heaters, shall not be greater than 735 pounds (nominal 300 pounds LP-gas capacity). Such manifolds shall be separated by at least 20 feet.

(p) Storage of containers awaiting use shall be in accordance with subsections (10) and (11) of this section.

(9) Multiple container systems.

(a) Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system. This provision is not to be construed as requiring an automatic changeover device.

(b) Heaters shall be equipped with an approved regulator in the supply line between the fuel cylinder and the heater unit. Cylinder connectors shall be provided with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.

(c) Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls, or otherwise rigidly secured, and shall be so installed or protected from the elements.

(10) Storage of LPG containers. Storage of LPG within building is prohibited.

(11) Storage outside of buildings.

(a) Storage outside of buildings, for containers awaiting use, shall be located from the nearest building or group of buildings, in accordance with Table D-3:

TABLE D-3

Quantity of LP-gas stored:	Distance (feet)
500 lbs. or less	0
501 to 6,000 lbs.	10
6,001 to 10,000 lbs.	20
Over 10,000 lbs.	25

(b) Containers shall be in a suitable ventilated enclosure or otherwise protected against tampering, or possible damage by vehicular traffic.

(12) Fire protection. Storage locations shall be provided with at least one approved portable fire extinguisher having a rating of not less than 20-B:C.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-155-275, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-275, filed 1/21/86; Order 76-29, § 296-155-275, filed 9/30/76; Order 74-26, § 296-155-275, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-280 Temporary heating devices. (1) Ventilation.**

(a) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workers. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.

(b) When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workers, and limit temperature rise in the area.

**(2) Clearance and mounting.**

(a) Temporary heating devices shall be installed to provide clearance to combustible material not less than the amount shown in Table D-4.

(b) Temporary heating devices, which are listed for installation with lesser clearances than specified in Table D-4, may be installed in accordance with their approval.

(2007 Ed.)

TABLE D-4

Heating appliances	Minimum clearance, (inches)		
	Sides	Rear	Chimney connector
Room heater, circulating type	12	12	18
Room heater, radiant type	36	36	18

(c) Heaters not suitable for use on wood floors shall not be set directly upon them or other combustible materials. When such heaters are used, they shall rest on suitable heat insulating material or at least 1-inch concrete, or equivalent. The insulating material shall extend beyond the heater 2 feet or more in all directions.

(d) Heaters used in the vicinity of combustible tarpaulins, canvas, or similar coverings shall be located at least 10 feet from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.

(3) Stability. Heaters, when in use, shall be set horizontally level, unless otherwise permitted by the manufacturer's markings.

(4) Oil-fired heaters.

(a) Flammable liquid-fired heaters shall be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed shall not be considered a primary safety control.

(b) Heaters designed for barometric or gravity oil feed shall be used only with the integral tanks.

(c) Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

(5) Salamanders.

(a) Coverage. The use of solid fuel salamanders is prohibited in buildings and on scaffolds.

(b) General requirements.

(i) All solid fuel salamanders shall be designed and constructed for use with solid fuel, that is, coal or coke.

(ii) Solid fuel salamanders shall be equipped with a cover designed as part of the unit, to prevent spillage of burning material in case of tipover.

(iii) Salamanders shall be assembled in accordance with the instructions issued by the manufacturer.

(iv) The safeguards engineered into the product shall be maintained and any replacement shall be equivalent thereto.

(v) Salamanders shall be stored in such a manner as to prevent deterioration or damage to the unit.

(c) Operation.

(i) Manufacturers' instructions shall be followed by the user.

(ii) Each time a salamander is placed in operation it shall be checked to insure that it is functioning properly. Its operation shall be checked periodically thereafter.

(iii) When concentrations of carbon monoxide attain quantities greater than 35 parts per million (0.0035 percent) to air volume at employee breathing levels, the salamander shall be extinguished unless additional natural or mechanical

ventilation is provided to reduce the carbon monoxide content to permissible limits.

(iv) Tests for presence of carbon monoxide shall be made by a qualified person within 1 hour after the start of each shift and at least every 3 hours thereafter. If concentrations of carbon monoxide reach 20 parts per million to air volume, tests shall be made more frequently to determine if there is a continuing increase of carbon monoxide concentration.

(v) Records of all tests including the date, time, results obtained, and person making tests, shall be maintained for the duration of the project.

(vi) No persons shall be permitted to be within the area being heated by the salamanders except under the following circumstances: When tending the salamanders; when testing the atmosphere; or in emergency situations.

(vii) No employee shall be permitted to enter the heated area until notification is given to another person located outside. Periodic checks shall be made to ensure the health and safety of employees entering the heated area.

(viii) When a salamander is being used, the responsibility for its operation and maintenance shall be assigned to a qualified employee.

(ix) Salamanders shall not be moved, handled, or serviced while hot or burning, or while component parts are hot to the touch.

(x) Salamanders, when in use, shall be set level with the horizontal unless otherwise permitted by the manufacturer's markings. Salamanders shall be designed so as not to tip over when placed on a surface inclined 25° to the horizontal.

(xi) If equivalent protection and safety is afforded by alternative design, the 25° limitation may be reduced.

(xii) Salamanders not suitable for use on wood floors shall not be set directly upon them or other combustible materials. When such salamanders are used they shall rest on suitable insulating material or at least 1-inch concrete or equivalent. The insulating material shall extend beyond the salamander 2 feet or more in all directions.

(xiii) Salamanders used in the vicinity of tarpaulins, canvas, or similar coverings shall be located a safe distance from coverings and other combustible materials. The coverings shall be securely fastened to prevent ignition of the covering or upsetting of the salamanders due to wind action on the covering or other material.

(xiv) Salamanders in use shall be protected to prevent flame extinguishment.

(d) Ventilation.

(i) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of employees. Where natural means for fresh air supply is inadequate, mechanical ventilation shall be provided. Particular attention shall be given to confined spaces and pockets where heat and fumes may accumulate and employees may be present (roof areas, peaks, basement).

(ii) When salamanders are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to assure proper combustion, maintain the health and safety of employees, and limit temperature rise in the area.

(e) Fueling.

(i) Salamanders shall be refueled only by a person trained in such operations.

(ii) Only a 1 day's supply of heater fuel shall be stored inside a building in the vicinity of the salamander. General fuel storage shall be outside the structure.

(iii) All fuel storage shall be maintained a minimum of 25 feet from source of ignition.

(f) Maintenance.

(i) The user shall comply with the maintenance instructions as provided by the manufacturer.

(ii) Equipment showing evidence of deterioration or damage that constitutes a safety or health hazard shall be removed from service.

(iii) Salamander repairs shall be performed in accordance with the manufacturer's recommendations, and replacement parts shall be equal to, the equivalent of, or the same as the original salamander equipment.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-280, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-280, filed 9/30/76; Order 74-26, § 296-155-280, filed 5/7/74, effective 6/6/74.]

## PART E SIGNALING AND FLAGGERS

### WAC 296-155-305 Signaling and flaggers.

#### Definition:

*Flagger* means a person who provides temporary traffic control.

For the purposes of this chapter, *MUTCD* means the Federal Highway Administration's Manual on Uniform Traffic Control as currently modified and adopted by the Washington state department of transportation.

**Link:** For the current version of the MUTCD, see the department of transportation's web site at <http://www.wsdot.wa.gov/biz/trafficoperations/mutcd.htm>.

(1) General requirements for signaling and flaggers.

(a) Employers must first apply the requirements in this section. Then you must set up and use temporary traffic controls according to the guidelines and recommendations in Part VI of the MUTCD.

(b) Job site workers with specific traffic control responsibilities must be trained in traffic control techniques, device usage, and placement.

Note:

- You may purchase copies of the MUTCD by writing:

U.S. Government Printing Office  
Superintendent of Documents  
Mail Stop: SSOP,  
Washington D.C. 20402-9328

- You may view and print a copy of the MUTCD at the following web site <http://www.wsdot.wa.gov/biz/trafficoperations/mutcd.htm>.

(2) When to use flaggers.

(a) Flaggers are to be used only when other reasonable traffic control methods will not adequately control traffic in the work zone.

(b) If signs, signals, and barricades do not provide necessary protection from traffic at work zones and construction sites on or adjacent to a highway or street, then you must use flaggers or other appropriate traffic controls.

## (3) Flagger signaling.

(a) Flagger signaling must be with sign paddles approved by WSDOT and conform to guidelines and recommendations of MUTCD.

(b) Sign paddles must comply with the requirements of the MUTCD.

(c) When flagging is done during periods of darkness, sign paddles must be retroreflective or illuminated in the same manner as signs.

(d) During emergency situations, red flags, meeting the specifications of the MUTCD, may be used to draw a driver's attention to particularly hazardous conditions. In non-emergency situations, a red flag may be held in a flagger's free hand to supplement the use of a sign paddle.

(4) Adequate warning of approaching vehicles. Employers must:

- Position work zone flaggers so they are not exposed to traffic or equipment approaching them from behind.

- If this is not possible, then the employer, responsible contractor, and/or project owner must develop and use a method to ensure that flaggers have adequate visual warning of traffic and equipment approaching from behind.

**Note:**

- The following are some optional examples of methods that may be used to adequately warn or protect flaggers:
  - Mount a mirror on the flagger's hard hat.
  - Use an observer.
  - Use "jersey" barriers.

- The department recognizes the importance of adequately trained flaggers and supports industry efforts to improve the quality of flagger training. However, training alone is not sufficient to comply with the statutory requirement of revising flagger safety standards to improve options available that ensure flagger safety and that flaggers have adequate visual warning of objects approaching from behind them.

## (5) High-visibility garments for flaggers.

(a) While flagging during daylight hours, a flagger must at least wear, as an outer garment:

- A high-visibility safety garment designed according to Class 2 specifications in ANSI/ISEA 107-1999, American National Standard for High-Visibility Safety Apparel.

- Consisting of at least 775 square inches of background material that are fluorescent yellow-green, fluorescent orange-red or fluorescent red in color;

**AND**

- 201 square inches of retroreflective material that encircles the torso and is placed to provide 360 degrees visibility around the flagger.

- A high visibility hard hat that is white, yellow, yellow-green, orange or red in color.

**Note:**

- A high-visibility garment meets Class 2 specifications if the garment:
  - Meets the requirements above;
- OR**
- Has an ANSI "Class 2" label.

**Definition:**

For the purpose of this rule, **hours of darkness** means one-half hour before sunset to one-half hour after sunrise.

(b) While flagging during hours of darkness, a flagger must at least wear, as an outer garment:

- A high-visibility safety garment designed according to Class 2 specifications in ANSI/ISEA 107-1999.

(2007 Ed.)

- Consisting of at least 775 square inches of background material that are fluorescent yellow-green, fluorescent orange-red or fluorescent red in color;

**AND**

- 201 square inches of retroreflective material that encircles the torso and is placed to provide 360 degrees visibility around the flagger.

- White coveralls, or other coveralls or trousers that have retroreflective banding on the legs designed according to ANSI/ISEA 107-1999 standards.

- When snow or fog limit visibility, pants, coveralls, or rain gear, meeting these additional requirements must be worn:

- In a highly visible color;

- With retroreflective banding on the legs;

- Designed according to ANSI/ISEA 107-1999.

- A high-visibility hard hat:

- Marked with at least 12 square inches of retroreflective material applied to provide 360 degrees of visibility.

**Note:**

- ANSI/ISEA 107-1999 is available by:
  - Purchasing copies of ANSI/ISEA 107-1999 by writing:
    - American National Standards Institute
    - 11 West 42nd Street
    - New York, NY 10036
  - OR**
  - Contacting the ANSI web site at <http://web.ansi.org/>.
- **OR**
- Reading a copy of ANSI/ISEA 107-1999 at any Washington state library.

## (6) Flagger training. Employers must make sure that:

(a) Each flagger has in their possession:

- A valid Washington traffic control flagger card; or
- A valid flagger card from a state such as:

- Oregon;

- Idaho;

- Montana;

**OR**

- Other states having a flagger training reciprocity agreement with Washington.

(b) The flagger card shows the following:

- Verification that the flagger training required is completed;

- Date the flagger received their flagger training;

- Name of the instructor providing the flagger training;

- Name of the state that issued the flagger card;

- The card's expiration date, not to exceed three years from the date of issuance;

**AND**

- The flagger's picture or a statement that says "valid with photo ID."

(c) Flagger training is based upon the MUTCD.

**Exemption:** Personnel that have not completed a flagger-training course may be assigned duties as flaggers only during emergencies. Emergency assignments are temporary and last only until a certified flagger can be put into the position.

**Definition:**

For the purpose of this rule, **emergency** means an unforeseen occurrence endangering life, limb, or property.

(7) Flagger orientation and traffic control plan.

(a) The employer, responsible contractor or project owner must conduct an orientation that familiarizes the flagger with the job site. This requirement applies each time the

flagger is assigned to a new project or when job site conditions change significantly.

The orientation must include, but is not limited to:

- The flagger's role and location on the job site;
- Motor vehicle and equipment in operation at the site;
- Job site traffic patterns;
- Communications and signals to be used between flaggers and equipment operators;

AND  
 • On-foot escape route;

- AND  
 • Other hazards specific to the job site.

(b) If flaggers are used on a job that will last more than one day, then the employer, responsible contractor and/or project owner must keep on-site, a current site specific traffic control plan. The purpose of this plan is to help move traffic through or around the construction zone in a way that protects the safety of the traveling public, pedestrians and workers.

The plan must include, but is not limited to, the following items when they are appropriate:

- Sign use and placement;
- Application and removal of pavement markings;
- Construction;

- Scheduling;
- Methods and devices for delineation and channelization;
- Placement and maintenance of devices;
- Placement of flaggers;
- Roadway lighting;
- Traffic regulations;

AND

- Surveillance and inspection.

(8) Advance warning signs.

(a) Employers must provide the following on all flagging operations:

- A three sign advance warning sequence on all roadways with a speed limit below 45 mph.
- A four sign advance warning sequence on all roadways with a 45 mph or higher speed limit.

(b) Warning signs must reflect the actual condition of the work zone. When not in use, warning signs must either be taken down or covered.

(c) Employers must make sure to follow Table 1 for spacing of advance warning sign placement.

**Table 1. Advanced Warning Sign Spacing**

Road Type	Speed	Distances Between Advance Warning Signs*			
		A**	B**	C**	D**
Freeways & Expressways	70 55	1,500 ft.+/- or per the MUTCD.	1,500 ft.+/- or per the MUTCD.	1,500 ft.+/- or per the MUTCD.	1,500 ft.+/- or per the MUTCD.
Rural Highways	65 60	1,000 ft.+/-	1,000 ft.+/-	1,000 ft.+/-	1,000 ft.+/-
Rural Roads	55 45	500 ft.+/-	500 ft.+/-	500 ft.+/-	500 ft.+/-
Rural Roads and Urban Arterials	40 35	350 ft.+/-	350 ft.+/-	350 ft.+/-	N/A
Rural Roads, Urban Streets, Residential Business Districts	30 25	200 ft.***	200 ft.***	200 ft.***	N/A
Urban Streets	25 or less	100 ft.***	100 ft.***	100 ft.***	N/A

\* All spacing may be adjusted to accommodate interchange ramps, at-grade intersections, and driveways.

\*\* This refers to the distance between advance warning signs. See Figure 1, Typical Lane Closure on Two-Lane Road. This situation is typical for roadways with speed limits less than 45 mph.

\*\*\* This spacing may be reduced in urban areas to fit roadway conditions.

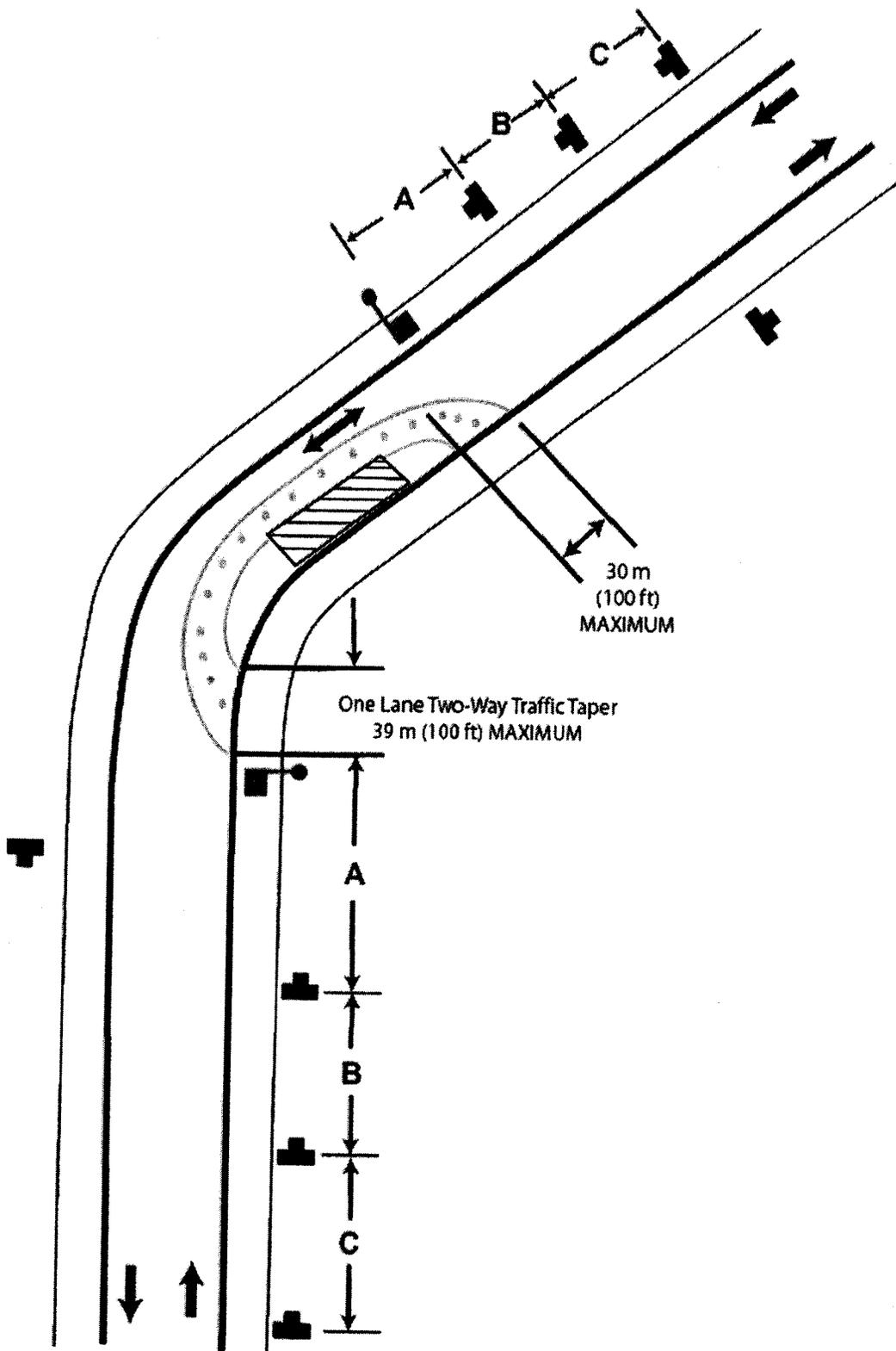
**Exemption:** In a mobile flagging operation, as defined by the MUTCD when the flagger is moving with the operation, the "flagger ahead (symbol or text)" sign must be:

- Within 1,500 feet of the flagger;

AND

- The flagger station must be seen from the sign.

If terrain does not allow a motorist to see the flagger from the "flagger ahead" sign, the distance between the flagger and the sign must be shortened to allow visual contact, but in no case can the distance be less than the distance specified in Table 1, Advanced Warning Sign Spacing.



(9) Providing a safe job site for flaggers. Employers, responsible contractors and/or project owners must make sure that:

(a) Flagger stations are located far enough in advance of the work space so that the approaching road users will have sufficient distance to stop before entering the work space.

Follow Table 2 for the distance of the flagger workstation in advance of the work space.

**Table 2. Distance of Flagger Station in Advance of the Work Space**

Speed* (mph)	Distance (ft)**
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

\*Posted speed, off-peak 85th-percentile speed prior to work starting or the anticipated operating speed.

\*\*This spacing may be reduced to fit roadway and work-site conditions. Distances greater than those listed in the table are acceptable.

(b) Flaggers stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users. A flagger must only stand in the lane being used by moving road users after road users have stopped.

**Definition:**

Road user means a vehicle operator, bicyclist, or pedestrian within a public roadway, including workers in temporary traffic control zones.

(c) Flagger workstations are illuminated during hours of darkness by floodlights that do not create glare that poses a hazard for drivers.

**Note:** To identify potential glare, observe the lighted area from various directions and angles on the main roadway after initial floodlight setup.

**Exemption:** Emergency situations are exempt from these illumination requirements. For the purpose of this rule, *emergency* means an unforeseen occurrence endangering life, limb, or property.

(d) Flaggers are not assigned other duties while engaged in flagging activities.

(e) Flaggers do not use devices that may distract the flagger's vision, hearing, or attention.

- Examples of these devices include cell phones, pagers, radios, and headphones.

- Devices such as two-way radios used for communications between flaggers to direct traffic or ensure flagger safety are acceptable.

(f) Flaggers receive a rest period of at least ten minutes, on the employer's time, for each four hours of working time.

- Rest periods must be scheduled as near as possible to the midpoint of the work period.

- A flagger must not be allowed to work more than three hours without a rest period.

**Exemption:** Scheduled rest periods are not required where the nature of the work allows a flagger to take intermittent rest periods equivalent to ten minutes for each four hours worked.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-05-027, § 296-155-305, filed 2/7/06, effective 4/1/06; 04-24-089, § 296-155-305, filed 12/1/04, effective 1/1/05; 03-06-075, § 296-155-305, filed 3/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, 2000 c 239, and chapter 34.05 RCW. 01-04-015, § 296-155-305, filed 1/26/01, effective 2/28/01. Statutory Authority: Chapter 49.17

RCW. 93-19-142 (Order 93-04), § 296-155-305, filed 9/22/93, effective 11/1/93; 93-01-067 (Order 92-15), § 296-155-305, filed 12/11/92, effective 1/15/93; 89-11-035 (Order 89-03), § 296-155-305, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-305, filed 1/21/86; Order 76-6, § 296-155-305, filed 3/1/76; Order 74-26, § 296-155-305, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-310 Barricades.** Employers must make sure that barricades used for the protection of employees meet the requirements of Part VI of the MUTCD.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-24-089, § 296-155-310, filed 12/1/04, effective 1/1/05; 03-06-075, § 296-155-310, filed 3/4/03, effective 8/1/03. Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-310, filed 9/22/93, effective 11/1/93; Order 74-26, § 296-155-310, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-315 Definitions applicable to this part.**

(1) "Barricade" means an obstruction to deter the passage of persons or vehicles.

(2) "Signs" are the warnings of hazard, temporarily or permanently affixed or placed, at locations where hazards exist.

(3) "Signals" are moving signs, provided by workers, such as flaggers, or by devices, such as flashing lights, to warn of possible or existing hazards.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-24-089, § 296-155-315, filed 12/1/04, effective 1/1/05; 03-06-075, § 296-155-315, filed 3/4/03, effective 8/1/03. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-315, filed 7/20/94, effective 9/20/94; Order 76-6, § 296-155-315, filed 3/1/76.]

**PART F**

**MATERIAL HANDLING, STORAGE, USE AND DISPOSAL**

**WAC 296-155-325 General requirements for storage.** (1) General.

(a) All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.

(b) Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads shall not be exceeded.

(c) Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.

(d) When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

(2) Material storage.

(a)(i) Material stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the material stored.

(ii) Temporary floors, used in steel erection, concrete forms and shoring (i.e., stripped forms, shoring jacks, clamps, steel rods or pipes, base plates, etc.) placed within close proximity to an open-sided floor for movement to another tier for placement, shall be considered "in-process equipment and subject to the provisions contained in Parts "O" and "P" of this standard. When this type equipment is to be left overnight or for longer periods of time it shall be

anchored and braced to prevent displacement in any direction. In addition this equipment shall be subject to the provisions of this subsection while in "interim storage."

(b) Each employee required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with personal fall arrest equipment meeting the requirements of chapter 296-155 WAC, Part C-1.

(c) Noncompatible materials shall be segregated in storage.

(d) Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.

(i) When cement and lime is delivered in paper bags they shall be carefully handled to prevent the bags bursting.

(ii) Cement and lime bags shall not be piled more than ten bags high except when stored in bins or enclosures built for the purpose of storage.

(iii) When bags are removed from the pile, the length of the pile shall be kept at an even height, and the necessary step backs every five bags maintained.

(iv) Persons handling cement and lime bags shall wear eye protection which prevents contact between the substance and the worker's eyes (such as goggles or other sealed eye protection) and shall wear long sleeve shirts with close fitting collar and cuffs.

(v) Persons shall be warned against wearing clothing that has become hard and stiff with cement.

(vi) Persons shall be instructed to report any susceptibility of their skin to cement and lime burns.

(vii) A hand cream or vaseline and eye wash shall be provided and kept ready for use to prevent burns.

(viii) Lime shall be stored in a dry place to prevent a premature slacking action that may cause fire.

(e) Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

(f) Brick stacks shall not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level.

(i) Brick shall never be stacked, for storage purposes, on scaffolds or runways.

(ii) When delivering brick on scaffolds inside the wall lines in wheelbarrows, they shall be dumped toward the inside of the building and not toward the wall.

(iii) Blocks shall always be stacked and not thrown in a loose pile.

(g) When masonry blocks are stacked higher than 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.

(i) When blocks are stacked inside a building, the piles shall be so distributed as not to overload the floor on which they stand.

(ii) Blocks shall not be dropped or thrown from an elevation or delivered through chutes.

(h) Lumber:

(i) Used lumber shall have all nails withdrawn before stacking.

(ii) Lumber shall be stacked on level and solidly supported sills.

(iii) Lumber shall be so stacked as to be stable and self-supporting.

(2007 Ed.)

(iv) Lumber stacks shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high.

(v) All stored lumber shall be stacked on timber sills to keep it off the ground. Sills shall be placed level on solid supports.

(vi) Cross strips shall be placed in the stacks when they are stacked more than four feet high.

(i) Structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent spreading or tilting.

(i) Persons handling reinforcing steel shall wear heavy gloves.

(ii) When bending of reinforcing steel is done on the job, a strong bench shall be provided, set up on even dry ground or a floor for the persons to work on.

(ii) Structural steel shall be carefully piled to prevent danger of members rolling off or the pile toppling over.

(iv) Structural steel shall be kept in low piles, consideration being given to the sequence of use of the members.

(v) Corrugated and flat iron shall be stacked in flat piles, with the piles not more than four feet high and spacing strips shall be placed between each bundle.

(j) Sand, gravel and crushed stone.

(i) Stock piles shall be frequently inspected to prevent their becoming unsafe by continued adding to or withdrawing from the stock.

(ii) If material becomes frozen, it shall not be removed in a manner that would produce an overhang.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-325, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-325, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-325, filed 1/21/86; Order 74-26, § 296-155-325, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-329 Qualified person—Rigging.** Qualified person - A person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter.

Also has authorization or authority by the nature of their position to take prompt corrective measures to eliminate them. The person shall be knowledgeable in the requirements of this part.

[Recodified as § 296-155-329, filed 8/4/98, effective 8/4/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-13-069, § 296-155-229, filed 6/15/98, effective 8/15/98.]

**WAC 296-155-330 Rigging equipment for material handling.** (1) General.

(a) Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

(b) Rigging equipment shall not be loaded in excess of its recommended safe working load, as prescribed in Tables F-1 through F-20 in this part and shall comply with ANSI/ASME B30.9-1996.

(c) Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

(d) Special rigging accessories (i.e., spreader bars, grabs, hooks, clamps, etc.) or other lifting accessories shall be marked with the rated capacity. All components shall be proof-tested to 125 percent of the rated load prior to the first use. Permanent records shall be maintained on the job site for all special rigging accessories.

(2) Alloy steel chains. Chains used for overhead lifting shall be proof tested alloy steel.

(a) Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

(b) Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.

(c) The use of job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall be prohibited.

(d) Rated capacity (working load limit) for alloy steel chain slings shall conform to the values shown in Table F-1.

(e) Whenever wear at any point of any chain link exceeds that shown in Table F-2, the assembly shall be removed from service.

(f) If at any time any three foot length of chain is found to have stretched one-third the length of a link it shall be discarded.

(g) The practice of placing bolts, nails, or cold shuts between two links to shorten chains is prohibited.

(h) Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or passing one link through another and inserting a bolt or nail to hold it, is prohibited.

(i) Wherever annealing of chains is attempted, it shall be done in properly equipped annealing furnaces and under the direct supervision of a competent person.

(3) Wire rope.

(a) Table F-3 through F-14 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications, and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, provided that a safety factor of not less than 5 is maintained.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Wire rope shall not be secured by knots.

(d) The following limitations shall apply to the use of wire rope:

(i) An eye splice made in any wire rope shall have not less than three full tucks.

Note: This requirement shall not preclude the use of another form of splice or connection which can be shown to be as efficient and which is not otherwise prohibited.

(ii) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lower-

ing, or in pulling loads, shall consist of one continuous piece without knot or splice.

(iii) Wire rope shall not be used, if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.

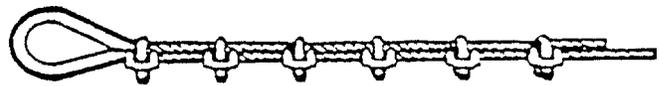
(e) When U-bolt wire rope clips are used to form eyes, Table F-20 shall be used to determine the number and spacing of clips.

(f) When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(g) U-Bolt wire rope clips shall be made of drop-forged steel.

Note: See Table F-20 for number of clamps and spacing requirements.

**CORRECT METHOD OF ATTACHING WIRE ROPE CLIPS**



U-Bolt of all clips on dead end of rope

(h) Slings shall not be shortened with knots or bolts or other makeshift devices.

(i) Thimbles shall be used in cable eyes whenever practicable.

(j) The clamp nuts shall be tightened up frequently during the operation to prevent slipping.

(4) Natural rope, and synthetic fiber.

(a) General. When using natural or synthetic fiber rope slings, Tables F-15, F-16, F-17 and F-18 shall apply.

(b) All splices in rope slings provided by the employer shall be made in accordance with fiber rope manufacturers' recommendations.

(i) In manila rope, eye splices shall contain at least three full tucks, and short splices shall contain at least six full tucks (three on each side of the centerline of the splice).

(ii) In layed synthetic fiber rope, eye splices shall contain at least four full tucks, and short splices shall contain at least eight full tucks (four on each side of the centerline of the splice).

(iii) Strand end tails shall not be trimmed short (flush with the surface of the rope) immediately adjacent to the full tucks. This precaution applies to both eye and short splices and all types of fiber rope. For fiber ropes under 1-inch diameter, the tails shall project at least six rope diameters beyond the last full tuck. For fiber ropes 1-inch diameter and larger, the tails shall project at least 6 inches beyond the last full tuck. In applications where the projecting tails may be objectionable, the tails shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

(iv) For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60° at the splice when the eye is placed over the load or support.

(v) Knots shall not be used in lieu of splices.

(vi) All fibre rope used for hoisting purposes or for the support of scaffolds, or any part thereof, shall be of high

grade Manila hemp (abaca). Fibre rope used for the support of scaffolds, or any part thereof, except rope used for lashing or tying purposes, shall be not less than 3/4-inch in diameter.

(vii) The maximum safe working load for fibre rope shall not exceed the maximum strength as shown in the following table:

STRENGTH OF HIGH GRADE MANILA (ABACA) ROPE  
COMMON LAY THREE STRAND

Approximate Diameter in inches	Circumference in inches	Safe Load in Pounds
3/16 (6 yarns)	1/2	98
1/4 (6 yarns)	3/4	116
5/16 (6 yarns)	1	200
3/8 (12 yarns)	1 1/8	241
7/16 (15 yarns)	1 1/4	291
15/32 (18 yarns)	1 3/8	350
1/2 (21 yarns)	1 1/2	408
9/16	1 3/4	526
5/8	2	666
3/4	2 1/4	816
13/16	2 1/2	983
7/8	2 3/4	1,166
1	3	1,366
1 1/16	3 1/4	1,683
1 1/8	3 1/2	1,833
1 1/4	3 3/4	2,083
1 5/16	4	2,365
1 3/8	4 1/4	2,666
1 1/2	4 1/2	2,916

Note: This table is based on data contained in the U.S. Department of Commerce circular of the Bureau of Standards, No. 324.

(5) Synthetic webbing (nylon, polyester, and polypropylene).

(a) The employer shall have each synthetic web sling marked or coded to show:

- (i) Name or trademark of manufacturer.
- (ii) Rated capacities for the type of hitch.
- (iii) Type of material.

(b) Rated capacity shall not be exceeded.

(6) Shackles and hooks.

(a) Table F-19 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than 5 is maintained.

(b) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(c) Hooks shall not be modified by welding and/or drilling unless written approval by the manufacturer has been received.

(d) No open hook shall be used to hoist a bucket, cage, spreader, or skip, nor in any circumstances where the dislodgment of the hook could cause a risk of injury to workers. A safety-hook, mousing, or shackle shall be employed in such circumstances.

(e) When shackles are used, shackle pins shall be secured to prevent accidental withdrawal.

(7) Slings.

(a) When slings are provided as a part of the hoisting equipment, every precaution shall be taken to keep them in a serviceable condition.

(i) Wire rope slings shall be frequently inspected and oiled.

(ii) Slings shall not be left where they can be damaged by traffic or form stumbling hazards.

(iii) Blocks or heavy bagging shall be used at corners of the load to protect the sling from sharp bending.

(iv) Wire rope which has been welded or been subject to welding of any kind shall not be used.

(v) The wire rope shall not be burned off with heat. This may weld the ends of the wires and strands together.

(b) When a load is lifted by a multiple rope sling the sling shall be so arranged that the strain can be equalized between the ropes.

(i) When using a sling with both ends engaged in the hoisting block, the sling shall be adjusted so as to equalize the stress.

(ii) Slings shall be placed on the load at safe lifting angles.

(8) Material handling—General.

(a) When necessary to store building material on public thoroughfares, care shall be exercised to see that it is so piled or stacked as to be safe against collapse or falling over.

(b) Material shall be so located as not to interfere with, or present a hazard to employees, traffic or the public.

(9) Placing and removal of forms.

(a) When moved or raised by crane, cableway, A-frame, or similar mechanical device, forms shall be securely attached to slings having a minimum safety factor of five. Use of No. 9 tie wire, fiber rope, and similar makeshift lashing shall be prohibited.

(b) Taglines shall be used in moving panels or other large sections of forms by crane or hoist.

(c) All hoisting equipment, including hoisting cable used to raise and move forms shall have a minimum safety factor incorporated in the manufacturer's design, and the manufacturer's recommended loading shall not be exceeded. Field-fabricated or shop-fabricated hoisting equipment shall be designed or approved by a registered professional engineer, incorporating a minimum safety factor of five in its design. Panels and built-up form sections shall be equipped with metal hoisting brackets for attachment of slings.

(10) Precast concrete and tilt-up operations.

(a) It shall be the responsibility of the contractor to use accessories which are designed to be compatible.

(b) The design capacity of all lifting devices and accessories shall be known. The devices and accessories with the appropriate capacity shall be used.

(c) Prior to pouring the panels of a tilt-up type construction job, a set of plans or job specifications, including lifting procedures, shall be drawn up.

(i) These plans shall be at the job site and made available upon request.

(ii) Any changes made in the rigging procedure of a tilt-up panel or slab shall provide the same degree of safety as required by the original plans.

(iii) The plans or specifications shall contain the following information:

- (A) The type, size, and location of all lifting inserts.
- (B) The type, size, and location of all brace inserts or fittings for guy wires in each panel and floor or support.
- (C) The size of braces or guys to be used.
- (D) The compression strength which concrete panels must attain prior to being lifted.
- (iv) The following conditions shall be included in the erection process and shall be incorporated in the design plan:
  - (A) Inserts to be installed for lifting sections of tilt-up precast panels shall be designed mechanically to maintain a safety factor of three.
  - (B) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.
  - (C) The compression strength of the concrete shall be such that when the proper type, size, and amount of inserts are installed a minimum safety factor of two will be maintained.
  - (v) Lifting hardware shall be capable of supporting at least five times the maximum intended load applied or transmitted to the lifting hardware.
  - (vi) Lifting bolts or other lifting devices which have been bent, worn, or are otherwise defective shall be discarded.
  - (vii) Manufactured products shall not be altered in a manner which would reduce the safe working load to less than its original value.
  - (viii) Inserts shall be positioned so that bolts, or lifting devices, when inserted, will be perpendicular to the face on which they are placed.

(d) Design of the panels and layout of the pour shall be made in such a manner so that when picking, the top of the panel will be away from the crane. If this is not possible, the contractor shall consult with a representative of the department and the crane company involved to determine the procedure to be followed in lifting and placing in its permanent position safely. Panels shall be lifted and handled in such a manner that they will not strike the hoisting equipment, in case of failure.

(e) A qualified rigging person shall be designated and shall consult with the crane operator on lifting procedures prior to making the pick. The qualified rigging person shall be located in such a position during the pick of the panel that they can observe both the crane operator and the employees working in the immediate area.

(11) Rigging in prestressed and post tensioned.

(a) Stressed members shall be handled at pick points specifically designated on the manufacturer's drawings.

(b) Stressed members shall be lifted with lifting devices recommended by the manufacturer or the engineer in charge.

(c) No one shall be allowed under stressed members during lifting and erection.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-13-069, § 296-155-330, filed 6/15/98, effective 8/15/98. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-330, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-330, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-330, filed 7/31/79; Order 76-29, § 296-

155-330, filed 9/30/76; Order 74-26, § 296-155-330, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-335 Disposal of waste materials.** (1) Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used. For the purpose of this subsection, an enclosed chute is a slide, closed in on all sides, through which material is moved from a high place to a lower one.

(2) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 20 feet back from the projected edge of the opening above. Signs warning of the hazard of falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(3) All scrap lumber, waste material, and rubbish shall be removed from the immediate work area as the work progresses.

(4) Disposal of waste material or debris by burning shall comply with local fire regulations.

(5) All solvent waste, oily rags, and flammable liquids shall be kept in fire resistant covered containers until removed from the worksite.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-335, filed 1/21/86; Order 74-26, § 296-155-335, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34901 Table F-1.**

**TABLE F-1**  
RATED CAPACITY (WORKING LOAD LIMIT),  
FOR ALLOY STEEL CHAIN SLINGS\*  
RATED CAPACITY  
(WORKING LOAD LIMIT), POUNDS  
**TABLE F-1: PART 1—Double Slings**

Chain Size, Inches	Single Branch Sling - 90 degrees Loading	Double Sling Vertical Angle <sup>1</sup>		
		30 degree	45 degree	60 degree
		Horizontal Angle <sup>2</sup>		
		60 degree	45 degree	30 degree
1/4	3,250	5,560	4,550	3,250
3/8	6,600	11,400	9,300	6,600
1/2	11,250	19,500	15,900	11,250
5/8	16,500	28,500	23,300	16,500
3/4	23,000	39,800	32,500	23,000
7/8	28,750	49,800	40,600	28,750
1	38,750	67,100	54,800	38,750
1-1/8	44,500	77,000	63,000	44,500
1-1/4	57,500	99,500	81,000	57,500
1-3/8	67,000	116,000	94,000	67,000
1-1/2	80,000	138,000	112,500	80,000
1-3/4	100,000	172,000	140,000	100,000

**TABLE F-1: PART 2—Triple and Quadruple Slings**

Chain Size, Inches	Single Branch Sling - 90 degrees Loading	Triple and Quadruple Sling Vertical Angle <sup>1</sup>		
		30 degree	45 degree	60 degree
		Horizontal Angle <sup>2</sup>		
		60 degree	45 degree	30 degree
1/4	3,250	8,400	6,800	4,900
3/8	6,600	17,000	14,000	9,900
1/2	11,250	29,000	24,000	17,000
5/8	16,000	43,000	35,000	24,500
3/4	23,000	59,500	48,500	34,500
7/8	28,750	74,500	61,000	43,000
1	38,750	101,000	82,000	58,000

**TABLE F-1: PART 2—Triple and Quadruple Slings**

1-1/8	44,500	115,500	94,500	66,500
1-1/4	57,500	149,000	121,500	86,000
1-3/8	67,000	174,000	141,000	100,500
1-1/2	80,000	207,000	169,000	119,500
1-3/4	100,000	258,000	210,000	150,000

<sup>1</sup> Rating of multileg slings adjusted for angle of loading measured as the included angle between the inclined leg and the vertical.

<sup>2</sup> Rating of multileg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load.

\* Other grades of proof tested steel chain include proof coil, BBB coil and hi-test chain. These grades are not recommended for overhead lifting and therefore are not covered by this standard.

[Order 74-26, § 296-155-335 (part), Table F-1 (codified as WAC 296-155-34901), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34902 Table F-2.**

**TABLE F-2**

**MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK**

Chain Size (inches)	Maximum Allowable Wear (inch)
1/4	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	11/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	11/32

[Order 74-26, § 296-155-335 (part), Table F-2 (codified as WAC 296-155-34902), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34903 Table F-3.**

**TABLE F-3**

**RATED CAPACITIES FOR SINGLE LEG SLINGS  
6 x 19 and 6 x 37 CLASSIFICATION  
IMPROVED PLOW STEEL GRADE ROPE  
WITH FIBER CORE (FC)**

Rope Dia. Constr. (Inches)	Rated Capacities, Tons (2,000 lb)								
	Vertical			Choker			Vertical Basket*		
	HT	MS	S	HT	MS	S	HT	MS	S
1/4 6x19	0.49	0.51	0.55	0.37	0.38	0.41	0.99	1.0	1.1
5/16 6x19	0.76	0.79	0.85	0.57	0.59	0.64	1.5	1.6	1.7
3/8 6x19	1.1	1.1	1.2	0.80	0.85	0.91	2.1	2.2	2.4
7/16 6x19	1.4	1.5	1.6	1.1	1.1	1.2	2.9	3.0	3.3
1/2 6x19	1.8	2.0	2.1	1.4	1.5	1.6	3.7	3.9	4.3
9/16 6x19	2.3	2.5	2.7	1.7	1.9	2.0	4.6	5.0	5.4
5/8 6x19	2.8	3.1	3.3	2.1	2.3	2.5	5.6	6.2	6.7
3/4 6x19	3.9	4.4	4.8	2.9	3.3	3.6	7.8	8.8	9.5
7/8 6x19	5.1	5.9	6.4	3.9	4.5	4.8	10.0	12.0	13.0
1 6x19	6.7	7.7	8.4	5.0	5.8	6.3	13.0	15.0	17.0
1- 1/8 6x19	8.4	9.5	10.0	6.3	7.1	7.9	17.0	19.0	21.0
1- 1/4 6x37	9.8	11.0	12.0	7.4	8.3	9.2	20.0	22.0	25.0
1- 3/8 6x37	12.0	13.0	15.0	8.9	10.0	11.0	24.0	27.0	30.0
1- 1/2 6x37	14.0	16.0	17.0	10.0	12.0	13.0	28.0	32.0	35.0
1- 5/8 6x37	16.0	18.0	21.0	12.0	14.0	15.0	33.0	37.0	41.0
1- 3/4 6x37	19.0	21.0	24.0	14.0	16.0	18.0	38.0	43.0	48.0
2 6x37	25.0	28.0	31.0	18.0	21.0	23.0	49.0	55.0	62.0

HT = Hand tucked splice and hidden tuck splice. For hidden tuck splice (IWRC) use value in HT column.

MS = Mechanical splice.

S = Swaged or zinc poured socket.

\* These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S slings is 20 or greater where:

D = Diameter of curvature around which the body of the sling is bent.

d = Diameter of rope.

(2007 Ed.)

[Order 74-26, § 296-155-335 (part), Table F-3 (codified as WAC 296-155-34903), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34904 Table F-4.**

**TABLE F-4**

**RATED CAPACITIES FOR SINGLE LEG SLINGS  
6 x 19 and 6 x 37 CLASSIFICATION  
IMPROVED PLOW STEEL GRADE ROPE  
WITH INDEPENDENT WIRE ROPE CORE (IWRC)**

Rope Dia. Constr. (Inches)	Rated Capacities, Tons (2,000 lb.)								
	Vertical			Choker			Vertical Basket*		
	HT	MS	S	HT	MS	S	HT	MS	S
1/4 6x19	0.53	0.56	0.59	0.40	0.42	0.44	1.0	1.1	1.2
5/16 6x19	0.81	0.87	0.92	0.61	0.65	0.69	1.6	1.7	1.8
3/8 6x19	1.1	1.2	1.3	0.86	0.93	0.98	2.3	2.5	2.6
7/16 6x19	1.5	1.7	1.8	1.2	1.3	1.3	3.1	3.4	3.5
1/2 6x19	2.0	2.2	2.3	1.5	1.6	1.7	3.9	4.4	4.6
9/16 6x19	2.5	2.7	2.9	1.8	2.1	2.2	4.9	5.5	5.8
5/8 6x19	3.0	3.4	3.6	2.2	2.5	2.7	6.0	6.8	7.2
3/4 6x19	4.2	4.9	5.1	3.1	3.6	3.8	8.4	9.7	10.0
7/8 6x19	5.5	6.6	6.9	4.1	4.9	5.2	11.0	13.0	14.0
1 6x19	7.2	8.5	9.0	5.4	6.4	6.7	14.0	17.0	18.0
1- 1/8 6x19	9.0	10.0	11.0	6.8	7.8	8.5	18.0	21.0	23.0
1- 1/4 6x37	10.0	12.0	13.0	7.9	9.2	9.9	21.0	24.0	26.0
1- 3/8 6x37	13.0	15.0	16.0	9.6	11.0	12.0	25.0	29.0	32.0
1- 1/2 6x37	15.0	17.0	19.0	11.0	13.0	14.0	30.0	35.0	38.0
1- 5/8 6x37	18.0	20.0	22.0	13.0	15.0	17.0	35.0	41.0	44.0
1- 3/4 6x37	20.0	24.0	26.0	15.0	18.0	19.0	41.0	47.0	51.0
2 6x37	26.0	30.0	33.0	20.0	23.0	25.0	53.0	61.0	66.0

HT = Hand tucked splice. For hidden tuck splice (IWRC) use Table F3 values in HT column.

MS = Mechanical splice.

S = Swaged or zinc poured socket.

\* These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S slings is 20 or greater where:

D = Diameter of curvature around which the body of the sling is bent.

d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-4 (codified as WAC 296-155-34904), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34905 Table F-5.**

**TABLE F-5**

**RATED CAPACITIES FOR SINGLE LEG SLINGS  
CABLE LAND ROPE -  
MECHANICAL SPLICE ONLY  
7 x 7 x 7 & 7 x 7 x 19 CONSTRUCTIONS  
GALVANIZED AIRCRAFT GRADE ROPE  
7 x 6 x 19 IWRC CONSTRUCTION  
IMPROVED PLOW STEEL GRADE ROPE**

Rope Dia. (Inches)	Constr.	Rated Capacities, Tons (2,000 lb)		
		Vertical	Choker	Vertical Basket*
1/4	7x7x7	0.50	0.38	1.0
3/8	7x7x7	1.1	.81	2.2
1/2	7x7x7	1.8	1.4	3.7
5/8	7x7x7	2.8	2.1	5.5
3/4	7x7x7	3.8	2.9	7.6
5/8	7x7x19	2.9	2.2	5.8
3/4	7x7x19	4.1	3.0	8.1
7/8	7x7x19	5.4	4.0	11.0

Rope Dia. (Inches)	Constr.	Rated Capacities, Tons (2,000 lb)		
		Vertical	Choker	Vertical Basket*
1	7x7x19	6.9	5.1	14.0
1-1/8	7x7x19	8.2	6.2	16.0
1-1/4	7x7x19	9.9	7.4	20.0
3/4	7x6x19 IWRC	3.8	2.8	7.6
7/8	7x6x19 IWRC	5.0	3.8	10.0
1	7x6x19 IWRC	6.4	4.8	13.0
1-1/8	7x6x19 IWRC	7.7	5.8	15.0
1-1/4	7x6x19 IWRC	9.2	6.9	18.0
1-5/16	7x6x19 IWRC	10.0	7.5	20.0
1-3/8	7x6x19 IWRC	11.0	8.2	22.0
1-1/2	7x6x19 IWRC	13.0	9.6	26.0

[Title 296 WAC—p. 2091]

\* These values only apply when the D/d ratio is 10 or greater where:  
 D = Diameter of curvature around which the body of the sling is bent.  
 d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-5 (codified as WAC 296-155-34905), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34906 Table F-6.**

**TABLE F-6**

RATED CAPACITIES FOR SINGLE LEG SLINGS 8-PART AND 6-PART BRAIDED ROPE 6 x 7 AND 6 x 19 CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE 7 x 7 CONSTRUCTION GALVANIZED AIRCRAFT GRADE ROPE

Component Ropes		Rated Capacities, Tons (2,000 lb)					
Diameter (inches)	Constr.	Vertical		Choker		Basket Vertical to 30 degrees*	
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6 x 7	0.42	0.32	0.32	0.24	0.74	0.55
1/8	6 x 7	0.76	0.57	0.57	0.42	1.3	0.98
3/16	6 x 7	1.7	1.3	1.3	0.94	2.9	2.2
3/32	7 x 7	0.51	0.39	0.38	0.29	0.89	0.67
1/8	7 x 7	0.95	0.71	0.71	0.53	1.6	1.2
3/16	7 x 7	2.1	1.5	1.5	1.2	3.6	2.7
3/16	6 x 19	1.7	1.3	1.3	0.98	3.0	2.2
1/4	6 x 19	3.1	2.3	2.3	1.7	5.3	4.0
5/16	6 x 19	4.8	3.6	3.6	2.7	8.3	6.2
3/8	6 x 19	6.8	5.1	5.1	3.8	12.0	8.9
7/16	6 x 19	9.3	6.9	6.9	5.2	16.0	12.0
1/2	6 x 19	12.0	9.0	9.0	6.7	21.0	15.0
9/16	6 x 19	15.0	11.0	11.0	8.5	26.0	20.0
5/8	6 x 19	19.0	14.0	14.0	10.0	32.0	24.0
3/4	6 x 19	27.0	20.0	20.0	15.0	46.0	35.0
7/8	6 x 19	36.0	27.0	27.0	20.0	62.0	47.0
1	6 x 19	47.0	35.0	35.0	26.0	81.0	61.0

\* These values only apply when the D/d ratio is 20 or greater where:  
 D = Diameter of curvature around which the body of the sling is bent.  
 d = Diameter of component rope.

[Order 74-26, § 296-155-335 (part), Table F-6 (codified as WAC 296-155-34906), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34907 Table F-7.**

**TABLE F-7**

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS 6 x 19 AND 6 x 37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH FIBER CORE (FC)

**TABLE F-7: PART 1—2-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Angle	Horz 30 degree	Horz 30 degree	Horz 30 degree
1/4	6 x 19	0.85	0.88	0.70	0.72	0.49	0.51
5/16	6 x 19	1.3	1.4	1.1	1.1	0.76	0.79
3/8	6 x 19	1.8	1.9	1.5	1.6	1.1	1.1
7/16	6 x 19	2.5	2.6	2.0	2.2	1.4	1.5
1/2	6 x 19	3.2	3.4	2.6	2.8	1.8	2.0
9/16	6 x 19	4.0	4.3	3.2	3.5	2.3	2.5
5/8	6 x 19	4.8	5.3	4.0	4.4	2.8	3.1
3/4	6 x 19	6.8	7.6	5.5	6.2	3.9	4.4
7/8	6 x 19	8.9	10.0	7.3	8.4	5.1	5.9
1	6 x 19	11.0	13.0	9.4	11.0	6.7	7.7
1- 1/8	6 x 19	14.0	16.0	12.0	13.0	8.4	9.5
1- 1/4	6 x 37	17.0	19.0	14.0	16.0	9.8	11.0
1- 3/8	6 x 37	20.0	23.0	17.0	19.0	12.0	13.0
1- 1/2	6 x 37	24.0	27.0	20.0	22.0	14.0	16.0
1- 5/8	6 x 37	28.0	32.0	23.0	26.0	16.0	18.0
1- 3/4	6 x 37	33.0	37.0	27.0	30.0	19.0	21.0
2	6 x 37	43.0	48.0	35.0	39.0	25.0	28.0

HT = Hand tucked splice.

MS = Mechanical splice.

**TABLE F-7: PART 2—3-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Angle	Horz 30 degree	Horz 30 degree	Horz 30 degree
1/4	6 x 19	1.3	1.3	1.0	1.1	0.74	0.7
5/16	6 x 19	2.0	2.0	1.6	1.7	1.1	1.2
3/8	6 x 19	2.8	2.9	2.3	2.4	1.6	1.7
7/16	6 x 19	3.7	4.0	3.0	3.2	2.1	2.3
1/2	6 x 19	4.8	5.1	3.9	4.2	2.8	3.0
9/16	6 x 19	6.0	6.5	4.9	5.3	3.4	3.7
5/8	6 x 19	7.3	8.0	5.9	6.5	4.2	4.6
3/4	6 x 19	10.0	11.0	8.3	9.3	5.8	6.6
7/8	6 x 19	13.0	15.0	11.0	13.0	7.7	8.9
1	6 x 19	17.0	20.0	14.0	16.0	10.0	11.0
1- 1/8	6 x 19	22.0	24.0	18.0	20.0	13.0	14.0
1- 1/4	6 x 37	25.0	29.0	21.0	23.0	15.0	17.0
1- 3/8	6 x 37	31.0	35.0	25.0	28.0	18.0	20.0
1- 1/2	6 x 37	36.0	41.0	30.0	33.0	21.0	24.0
1- 5/8	6 x 37	43.0	48.0	35.0	39.0	25.0	28.0
1- 3/4	6 x 37	49.0	56.0	40.0	45.0	28.0	32.0
2	6 x 37	64.0	72.0	52.0	59.0	37.0	41.0

HT = Hand tucked splice.  
 MS = Mechanical splice.

[Order 74-26, § 296-155-335 (part), Table F-7 (codified as WAC 296-155-34907), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34908 Table F-8.**

**TABLE F-8**

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS 6 x 19 AND 6 x 37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH INDEPENDENT WIRE ROPE CORE (IWRC)

**TABLE F-8: PART 1—2-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Angle	Horz 30 degree	Horz 30 degree	Horz 30 degree
1/4	6 x 19	0.92	0.97	0.75	0.79	0.53	0.56
5/16	6 x 19	1.4	1.5	1.1	1.2	1.81	0.87
3/8	6 x 19	2.0	2.1	1.6	1.8	1.1	1.2
7/16	6 x 19	2.7	2.9	2.2	2.4	1.5	1.7
1/2	6 x 19	3.4	3.8	2.8	3.1	2.0	2.2
9/16	6 x 19	4.3	4.8	3.5	3.9	2.5	2.7
5/8	6 x 19	5.2	5.9	4.2	4.8	3.0	3.4
3/4	6 x 19	7.3	8.4	5.9	6.9	4.2	4.9
7/8	6 x 19	9.6	11.0	7.8	9.3	5.5	6.6
1	6 x 19	12.0	15.0	10.0	12.0	7.2	8.5
1- 1/8	6 x 19	16.0	18.0	13.0	15.0	9.0	10.0
1- 1/4	6 x 37	18.0	21.0	15.0	17.0	10.0	12.0
1- 3/8	6 x 37	22.0	25.0	18.0	21.0	13.0	15.0
1- 1/2	6 x 37	26.0	30.0	21.0	25.0	15.0	17.0
1- 5/8	6 x 37	31.0	35.0	25.0	29.0	18.0	20.0
1- 3/4	6 x 37	35.0	41.0	29.0	33.0	20.0	24.0
2	6 x 37	46.0	53.0	37.0	43.0	26.0	30.0

HT = Hand tucked splice.  
 MS = Mechanical splice.

**TABLE F-8: PART 2—3-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Angle	Horz 30 degree	Horz 30 degree	Horz 30 degree
1/4	6 x 19	1.4	1.4	1.1	1.2	0.79	0.84
5/16	6 x 19	2.1	2.3	1.7	1.8	1.2	1.3
3/8	6 x 19	3.0	3.2	2.4	2.6	1.7	1.9

Rope		Rated Capacities, Tons (2,000 lb)					
		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Horz 60 degree	Angle	Horz 30 degree	Angle
		HT	MS	HT	MS	HT	MS
7/16	6 x 19	4.0	4.4	3.3	3.6	2.3	2.5
1/2	6 x 19	5.1	5.7	4.2	4.6	3.0	3.3
9/16	6 x 19	6.4	7.1	5.2	5.8	3.7	4.1
5/8	6 x 19	7.8	8.8	6.4	7.2	4.5	5.1
3/4	6 x 19	11.0	13.0	8.9	10.0	6.3	7.3
7/8	6 x 19	14.0	17.0	12.0	14.0	8.3	9.9
1	6 x 19	19.0	22.0	15.0	18.0	11.0	13.0
1- 1/8	6 x 19	23.0	27.0	19.0	22.0	13.0	16.0
1- 1/4	6 x 37	27.0	32.0	22.0	26.0	16.0	18.0
1- 3/8	6 x 37	33.0	38.0	27.0	31.0	19.0	22.0
1- 1/2	6 x 37	39.0	45.0	32.0	37.0	23.0	26.0
1- 5/8	6 x 37	46.0	53.0	38.0	43.0	27.0	31.0
1- 3/4	6 x 37	53.0	61.0	43.0	50.0	31.0	35.0
2	6 x 37	68.0	79.0	56.0	65.0	40.0	46.0

HT = Hand tucked splice  
MS = Mechanical splice

[Order 74-26, § 296-155-335 (part), Table F-8 (codified as WAC 296-155-34908), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34909 Table F-9.**

**TABLE F-9**  
RATED CAPACITIES FOR 2-LEG  
AND 3-LEG BRIDLE SLINGS  
CABLE LAID ROPE -  
MECHANICAL SPLICE ONLY  
7 x 7 x 7 AND 7 x 7 x 19 CONSTRUCTIONS  
GALVANIZED AIRCRAFT GRADE ROPE  
7 x 6 x 19 IWRC CONSTRUCTION IMPROVED  
PLOW STEEL GRADE ROPE

Rope		Rated Capacities, Tons (2,000 lb)		
		2-Leg Bridle Sling		
Dia. (Inches)	Constr.	Vert 30 deg	45 degree	Vert 60 deg
		Horz 60 deg	Angle	Horz 30 deg
1/4	7 x 7 x 7	0.87	0.71	0.50
3/8	7 x 7 x 7	1.9	1.5	1.1
1/2	7 x 7 x 7	3.2	2.6	1.8
5/8	7 x 7 x 7	4.8	3.9	2.8
3/4	7 x 7 x 7	6.6	5.4	3.8
5/8	7 x 7 x 19	5.0	4.1	2.9
3/4	7 x 7 x 19	7.0	5.7	4.1
7/8	7 x 7 x 19	9.3	7.6	5.4
1	7 x 7 x 19	12.0	9.7	6.9
1- 1/8	7 x 7 x 19	14.0	12.0	8.2
1- 1/4	7 x 7 x 19	17.0	14.0	9.9
3/4	7 x 6 x 19 IWRC	6.6	5.4	3.8
7/8	7 x 6 x 19 IWRC	8.7	7.1	5.0
1	7 x 6 x 19 IWRC	11.0	9.0	6.4
1- 1/8	7 x 6 x 19 IWRC	13.0	11.0	7.7
1- 1/4	7 x 6 x 19 IWRC	16.0	13.0	9.2
1- 5/16	7 x 6 x 19 IWRC	17.0	14.0	10.0
1- 3/8	7 x 6 x 19 IWRC	19.0	15.0	11.0
1- 1/2	7 x 6 x 19 IWRC	22.0	18.0	13.0

**TABLE F-9: PART 2—3-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)		
		3-Leg Bridle Sling		
Dia. (Inches)	Constr.	Vert 30 deg	45 degree	Vert 60 deg
		Horz 60 deg	Angle	Horz 30 deg
1/4	7 x 7 x 7	1.3	1.1	0.75
3/8	7 x 7 x 7	2.8	2.3	1.6
1/2	7 x 7 x 7	4.8	3.9	2.8
5/8	7 x 7 x 7	7.2	5.9	4.2
3/4	7 x 7 x 7	9.9	8.1	5.7
5/8	7 x 7 x 19	7.5	6.1	4.3
3/4	7 x 7 x 19	10.0	8.6	6.1
7/8	7 x 7 x 19	14.0	11.0	8.1
1	7 x 7 x 19	18.0	14.0	10.0
1- 1/8	7 x 7 x 19	21.0	17.0	12.0

(2007 Ed.)

**TABLE F-9: PART 2—3-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)		
		3-Leg Bridle Sling		
Dia. (Inches)	Constr.	Vert 30 deg	45 degree	Vert 60 deg
		Horz 60 deg	Angle	Horz 30 deg
1- 1/4	7 x 7 x 19	26.0	21.0	15.0
3/4	7 x 6 x 19 IWRC	9.9	8.0	5.7
7/8	7 x 6 x 19 IWRC	13.0	11.0	7.5
1	7 x 6 x 19 IWRC	17.0	13.0	9.6
1- 1/8	7 x 6 x 19 IWRC	20.0	16.0	11.0
1- 1/4	7 x 6 x 19 IWRC	24.0	20.0	14.0
1- 5/16	7 x 6 x 19 IWRC	26.0	21.0	15.0
1- 3/8	7 x 6 x 19 IWRC	28.0	23.0	16.0
1- 1/2	7 x 6 x 19 IWRC	33.0	27.0	19.0

[Order 74-26, § 296-155-335 (part), Table F-9 (codified as WAC 296-155-34909), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34910 Table F-10.**

**TABLE F-10**  
RATED CAPACITIES FOR 2-LEG  
AND 3-LEG BRIDLE SLINGS  
8-PART AND 6-PART BRAIDED ROPE  
6 x 7 AND 6 x 19 CONSTRUCTION  
IMPROVED PLOW STEEL GRADE ROPE  
7 x 7 CONSTRUCTION GALVANIZED  
AIRCRAFT GRADE ROPE

**TABLE F-10: PART 1—2-Leg Bridle Slings**

Component		Rated Capacities, Tons (2,000 lb)					
Rope		2-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6 x 7	0.74	0.55	0.60	0.45	0.42	0.32
1/8	6 x 7	1.3	0.98	1.1	0.80	0.76	0.57
3/16	6 x 7	2.9	2.2	2.4	1.8	1.7	1.3
3/32	7 x 7	0.89	0.67	0.72	0.55	0.51	0.39
1/8	7 x 7	1.6	1.2	1.3	1.0	0.95	0.71
3/16	7 x 7	3.6	2.7	2.9	2.2	2.1	1.5
3/16	6 x 19	3.0	2.2	2.4	1.8	1.7	1.3
1/4	6 x 19	5.3	4.0	4.3	3.2	3.1	2.3
5/16	6 x 19	8.3	6.2	6.7	5.0	4.8	3.6
3/8	6 x 19	12.0	8.9	9.7	7.2	6.8	5.1
7/16	6 x 19	16.0	12.0	13.0	9.8	9.3	6.9
1/2	6 x 19	21.0	15.0	17.0	13.0	12.0	9.0
9/16	6 x 19	26.0	20.0	21.0	16.0	15.0	11.0
5/8	6 x 19	32.0	24.0	26.0	20.0	19.0	14.0
3/4	6 x 19	46.0	35.0	38.0	28.0	27.0	20.0
7/8	6 x 19	62.0	47.0	51.0	38.0	36.0	27.0
1	6 x 19	81.0	61.0	66.0	50.0	47.0	35.0

**TABLE F-10: PART 2—3-Leg Bridle Slings**

Component		Rated Capacities, Tons (2,000 lb)					
Rope		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6 x 7	1.1	0.83	0.90	0.68	0.64	0.48
1/8	6 x 7	2.0	1.5	1.6	1.2	1.1	0.85
3/16	6 x 7	4.4	3.3	3.6	2.7	2.5	1.9
3/32	7 x 7	1.3	1.0	1.1	0.82	0.77	0.58
1/8	7 x 7	2.5	1.8	2.0	1.5	1.4	1.1
3/16	7 x 7	5.4	4.0	4.4	3.3	3.1	2.3
3/16	6 x 19	4.5	3.4	3.7	2.8	2.6	1.9
1/4	6 x 19	8.0	6.0	6.5	4.9	4.6	3.4
5/16	6 x 19	12.0	9.3	10.0	7.6	7.1	5.4
3/8	6 x 19	18.0	13.0	14.0	11.0	10.0	7.7
7/16	6 x 19	24.0	18.0	20.0	15.0	14.0	10.0
1/2	6 x 19	31.0	23.0	25.0	19.0	18.0	13.0
9/16	6 x 19	39.0	29.0	32.0	24.0	23.0	17.0
5/8	6 x 19	48.0	36.0	40.0	30.0	28.0	21.0
3/4	6 x 19	69.0	52.0	56.0	42.0	40.0	30.0
7/8	6 x 19	94.0	70.0	76.0	57.0	54.0	40.0
1	6 x 19	122.0	91.0	99.0	74.0	70.0	53.0

[Title 296 WAC—p. 2093]

[Order 74-26, § 296-155-335 (part), Table F-10 (codified as WAC 296-155-34910), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34911 Table F-11.**

**TABLE F-11**  
RATED CAPACITIES FOR STRAND LAID  
GROMMET - HAND TUCKED IMPROVED  
PLOW STEEL GRADE ROPE

Rope Body		Rated Capacities, Tons (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
1/4	7 x 19	0.85	0.64	1.7
5/16	7 x 19	1.3	1.0	2.6
3/8	7 x 19	1.9	1.4	3.8
7/16	7 x 19	2.6	1.9	5.2
1/2	7 x 19	3.3	2.5	6.7
9/16	7 x 19	4.2	3.1	8.4
5/8	7 x 19	5.2	3.9	10.00
3/4	7 x 19	7.4	5.6	15.0
7/8	7 x 19	10.0	7.5	20.0
1	7 x 19	13.0	9.7	26.0
1-1/8	7 x 19	16.0	12.0	32.0
1-1/4	7 x 37	18.0	14.0	37.0
1-3/8	7 x 37	22.0	16.0	44.0
1-1/2	7 x 37	26.0	19.0	52.0

\* These values only apply when the D/d ratio is 5 or greater where:  
D = Diameter of curvature around which rope is bent.  
d = Diameter of rope body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34911, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-11 (codified as WAC 296-155-34911), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34912 Table F-12.**

**TABLE F-12**  
RATED CAPACITIES FOR CABLE LAID GROMMET -  
HAND TUCKED 7 x 6 x 7 AND 7 x 6 x 19  
CONSTRUCTIONS IMPROVED PLOW  
STEEL GRADE ROPE  
7 x 7 x 7 CONSTRUCTION GALVANIZED  
AIRCRAFT GRADE ROPE

Cable Body		Rated Capacities, Tons (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
3/8	7 x 6 x 7	1.3	0.95	2.5
9/16	7 x 6 x 7	2.8	2.1	5.6
5/8	7 x 6 x 7	3.8	2.8	7.6
3/8	7 x 7 x 7	1.6	1.2	3.2
9/16	7 x 7 x 7	3.5	2.6	6.9
5/8	7 x 7 x 7	4.5	3.4	9.0
5/8	7 x 6 x 19	3.9	3.0	7.9
3/4	7 x 6 x 19	5.1	3.8	10.0
15/16	7 x 6 x 19	7.9	5.9	16.0
1-1/8	7 x 6 x 19	11.0	8.4	22.0
1-5/16	7 x 6 x 19	15.0	11.0	30.0
1-1/2	7 x 6 x 19	19.0	14.0	39.0
1-11/16	7 x 6 x 19	24.0	18.0	49.0
1-7/8	7 x 6 x 19	30.0	22.0	60.0
2-1/4	7 x 6 x 19	42.0	31.0	84.0
2-5/8	7 x 6 x 19	56.0	42.0	112.0

\* These values only apply when the D/d ratio is 5 or greater where:  
D = Diameter of curvature around which cable body is bent.  
d = Diameter of cable body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34912, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-12 (codified as WAC 296-155-34912), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34913 Table F-13.**

**TABLE F-13**  
RATED CAPACITIES FOR STRAND LAID  
ENDLESS SLINGS-MECHANICAL JOINT  
IMPROVED PLOW STEEL GRADE ROPE

ROPE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
1/4	6 x 19 IWRC	0.92	0.69	1.8
3/8	6 x 19 IWRC	2.0	1.5	4.1
1/2	6 x 19 IWRC	3.6	2.7	7.2
5/8	6 x 19 IWRC	5.6	4.2	11.0
3/4	6 x 19 IWRC	8.0	6.0	16.0
7/8	6 x 19 IWRC	11.0	8.1	21.0
1	6 x 19 IWRC	14.0	10.0	28.0
1 - 1/8	6 x 19 IWRC	18.0	13.0	35.0
1 - 1/4	6 x 37 IWRC	21.0	15.0	41.0
1 - 3/8	6 x 37 IWRC	25.0	19.0	50.0
1 - 1/2	6 x 37 IWRC	29.0	22.0	59.0

\* These values only apply when the D/d ratio is 5 or greater where:  
D = Diameter of curvature around which rope is bent.  
d = Diameter of rope body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34913, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-13 (codified as WAC 296-155-34913), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34914 Table F-14.**

**TABLE F-14**  
RATED CAPACITIES FOR CABLE LAID  
ENDLESS SLINGS-MECHANICAL JOINT  
7 x 7 x 7 AND 7 x 7 x 19 CONSTRUCTIONS  
GALVANIZED AIRCRAFT GRADE ROPE  
7 x 6 x 19 IWRC CONSTRUCTION IMPROVED  
PLOW STEEL GRADE ROPE

CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
1/4	7 x 7 x 7	0.83	0.62	1.6
3/8	7 x 7 x 7	1.8	1.3	3.5
1/2	7 x 7 x 7	3.0	2.3	6.1
5/8	7 x 7 x 7	4.5	3.4	9.1
3/4	7 x 7 x 7	6.3	4.7	12.0
5/8	7 x 7 x 19	4.7	3.5	9.5
3/4	7 x 7 x 19	6.7	5.0	13.0
7/8	7 x 7 x 19	8.9	6.6	18.0
1	7 x 7 x 19	11.0	8.5	22.0
1 - 1/8	7 x 7 x 19	14.0	10.0	28.0
1 - 1/4	7 x 7 x 19	17.0	12.0	33.0
3/4	7 x 6 x 19 IWRC	6.2	4.7	12.0
7/8	7 x 6 x 19 IWRC	8.3	6.2	16.0
1	7 x 6 x 19 IWRC	10.0	7.9	21.0
1 - 1/8	7 x 6 x 19 IWRC	13.0	9.7	26.0
1 - 1/4	7 x 6 x 19 IWRC	16.0	12.0	31.0
1 - 3/4	7 x 6 x 19 IWRC	18.0	14.0	37.0
1 - 1/2	7 x 6 x 19 IWRC	22.0	16.0	43.0

\* These values only apply when the D/d value is 5 or greater where:  
D = Diameter of curvature around which cable body is bent.  
d = Diameter of cable body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34914, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-14 (codified as WAC 296-155-34914), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34915 Table F-15.

TABLE F-15  
MANILA ROPE SLINGS  
TABLE F-15: PART 1—Eye and Eye Sling

		RATED CAPACITY IN POUNDS (Safety Factor = 5)							
		EYE AND EYE SLING				BASKET HITCH			
		Angle of Rope to Horizontal				Angle of Rope to Vertical			
		90 deg	60 deg	45 deg	30 deg	90 deg	60 deg	45 deg	30 deg
ROPE Diameter	Nominal weight per 100 ft in	Minimum Breaking Strength in Pounds	Vertical Hitch	Choker Hitch	0 deg	30 deg	45 deg	60 deg	
1/2	7.5	2,650	550	250	1,100	900	750	550	
9/16	10.4	3,450	700	350	1,400	1,200	1,000	700	
5/8	13.3	4,400	900	450	1,800	1,500	1,200	900	
3/4	16.7	5,400	1,100	550	2,200	1,900	1,500	1,100	
13/16	19.5	6,500	1,300	650	2,600	2,300	1,800	1,300	
7/8	22.5	7,700	1,500	750	3,100	2,700	2,200	1,500	
1	27.0	9,000	1,800	900	3,600	3,100	2,600	1,800	
1 1/16	31.3	10,500	2,100	1,100	4,200	3,600	3,000	2,100	
1 1/8	36.0	12,000	2,400	1,200	4,800	4,200	3,400	2,400	
1 1/4	41.7	13,500	2,700	1,400	5,400	4,700	3,800	2,700	
1 5/16	47.9	15,000	3,000	1,500	6,000	5,200	4,300	3,000	
1 1/2	59.9	18,500	3,700	1,850	7,400	6,400	5,200	3,700	
1 5/8	74.6	22,500	4,500	2,300	9,000	7,800	6,400	4,500	
1 3/4	89.3	26,500	5,300	2,700	10,500	9,200	7,500	5,300	
2	107.5	31,000	6,200	3,100	12,500	10,500	8,800	6,200	
2 1/3	125.0	36,000	7,200	3,600	14,500	12,500	10,000	7,200	
2 1/4	146.0	41,000	8,200	4,100	16,500	14,000	11,500	8,200	
2 1/2	166.7	46,500	9,300	4,700	18,500	16,000	13,000	9,300	
2 5/8	190.8	52,000	10,500	5,200	21,000	18,000	14,500	10,500	

TABLE F-15: PART 2—Endless Sling

		RATED CAPACITY IN POUNDS (Safety Factor = 5)							
		ENDLESS SLING				BASKET HITCH			
		Angle of Rope to Horizontal				Angle of Rope to Vertical			
		90 deg	60 deg	45 deg	30 deg	90 deg	60 deg	45 deg	30 deg
ROPE Diameter	Nominal weight per 100 ft in	Minimum Breaking Strength in Pounds	Vertical Hitch	Choker Hitch	0 deg	30 deg	45 deg	60 deg	
1/2	7.5	2,650	950	500	1,900	1,700	1,400	950	
9/16	10.4	3,450	1,200	600	2,500	2,200	1,800	1,200	
5/8	13.3	4,400	1,600	800	3,200	2,700	2,200	1,600	
3/4	16.7	5,400	2,000	950	3,900	3,400	2,800	2,000	
13/16	19.5	6,500	2,300	1,200	4,700	4,100	3,300	2,300	
7/8	22.5	7,700	2,800	1,400	5,600	4,800	3,900	2,800	
1	27.0	9,000	3,200	1,600	6,500	5,600	4,600	3,200	
1 1/16	31.3	10,500	3,800	1,900	7,600	6,600	5,400	3,800	
1 1/8	36.0	12,000	4,300	2,200	8,600	7,500	6,100	4,300	
1 1/4	41.7	13,500	4,900	2,400	9,700	8,400	6,900	4,900	
1 5/16	47.9	15,000	5,400	2,700	11,000	9,400	7,700	5,400	
1 1/2	59.9	18,500	6,700	3,300	13,500	11,500	9,400	6,700	
1 5/8	74.6	22,500	8,100	4,100	16,000	14,000	11,500	8,000	
1 3/4	89.3	26,500	9,500	4,800	19,000	16,500	13,500	9,500	
2	107.5	31,000	11,000	5,600	22,500	19,500	16,000	11,000	
2 1/3	125.0	36,000	13,000	6,500	26,000	22,500	18,500	13,000	
2 1/4	146.0	41,000	15,000	7,400	29,500	25,500	21,000	15,000	
2 1/2	166.7	46,500	16,500	8,400	33,500	29,000	23,500	16,500	
2 5/8	190.8	52,000	18,500	9,500	37,500	32,500	26,500	18,500	

[Order 74-26, § 296-155-335 (part), Table F-15 (codified as WAC 296-155-34915), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34916 Table F-16.

TABLE F-16  
NYLON ROPE SLINGS  
TABLE F-16: PART 1—Eye and Eye Sling

		RATED CAPACITY IN POUNDS (Safety Factor = 9)							
		EYE AND EYE SLING				BASKET HITCH			
		Angle of Rope to Horizontal				Angle of Rope to Vertical			
		90 deg	60 deg	45 deg	30 deg	90 deg	60 deg	45 deg	30 deg
ROPE Diameter	Nominal weight per 100 ft in	Minimum Breaking Strength in Pounds	Vertical Hitch	Choker Hitch	0 deg	30 deg	45 deg	60 deg	
1/2	6.5	6,080	700	350	1,400	1,200	950	700	
9/16	8.3	7,600	850	400	1,700	1,500	1,200	850	
5/8	10.5	9,880	1,100	550	2,200	1,900	1,600	1,100	
3/4	14.5	13,490	1,500	750	3,000	2,600	2,100	1,500	
13/16	17.0	16,150	1,800	900	3,600	3,100	2,600	1,800	
7/8	20.0	19,000	2,100	1,100	4,200	3,700	3,000	2,100	
1	26.0	23,750	2,600	1,300	5,300	4,600	3,700	2,600	
1 1/16	29.0	27,360	3,000	1,500	6,100	5,300	4,300	3,000	
1 1/8	34.0	31,350	3,500	1,700	7,000	6,000	5,000	3,500	
1 1/4	40.0	35,625	4,000	2,000	7,900	6,900	5,600	4,000	
1 5/16	45.0	40,850	4,500	2,300	9,100	7,900	6,400	4,500	
1 1/2	55.0	50,350	5,600	2,800	11,000	9,700	7,900	5,600	
1 5/8	68.0	61,750	6,900	3,400	13,500	12,000	9,700	6,900	
1 3/4	83.0	74,100	8,200	4,100	16,500	14,500	11,500	8,200	
2	95.0	87,400	9,700	4,900	19,500	17,000	13,500	9,700	
2 1/8	109.0	100,700	11,000	5,600	22,500	19,500	16,000	11,000	
2 1/4	129.0	118,750	13,000	6,600	26,500	23,000	18,500	13,000	
2 1/2	149.0	133,000	15,000	7,400	29,500	25,500	21,000	15,000	
2 5/8	168.0	153,900	17,100	8,600	34,000	29,500	24,000	17,000	

TABLE F-16: PART 2—Endless Sling

		RATED CAPACITY IN POUNDS (Safety Factor = 9)							
		ENDLESS SLING				BASKET HITCH			
		Angle of Rope to Horizontal				Angle of Rope to Vertical			
		90 deg	60 deg	45 deg	30 deg	90 deg	60 deg	45 deg	30 deg
ROPE Diameter	Nominal weight per 100 ft in	Minimum Breaking Strength in Pounds	Vertical Hitch	Choker Hitch	0 deg	30 deg	45 deg	60 deg	
1/2	6.5	6,080	1,200	600	2,400	2,100	1,700	1,200	
9/16	8.3	7,600	1,500	750	3,000	2,600	2,200	1,500	
5/8	10.5	9,880	2,000	1,000	4,000	3,400	2,800	2,000	
3/4	14.5	13,490	2,700	1,400	5,400	4,700	3,800	2,700	
13/16	17.0	16,150	3,200	1,600	6,400	5,600	4,600	3,200	
7/8	20.0	19,000	3,800	1,900	7,600	6,600	5,400	3,800	
1	26.0	23,750	4,800	2,400	9,500	8,200	6,700	4,800	
1 1/16	29.0	27,360	5,500	2,700	11,000	9,500	7,700	5,500	
1 1/8	34.0	31,350	6,300	3,100	12,500	11,000	8,900	6,300	
1 1/4	40.0	35,625	7,100	3,600	14,500	12,500	10,000	7,100	
1 5/16	45.0	40,850	8,200	4,100	16,500	14,000	12,000	8,200	
1 1/2	55.0	50,350	10,000	5,000	20,000	17,500	14,000	10,000	
1 5/8	68.0	61,750	12,500	6,200	24,500	21,500	17,500	12,500	
1 3/4	83.0	74,100	15,000	7,400	29,500	27,500	21,000	15,000	
2	95.0	87,400	17,500	8,700	35,000	30,500	24,500	17,500	
2 1/8	109.0	100,700	20,000	10,000	40,500	35,000	28,500	20,000	
2 1/4	129.0	118,750	24,000	12,000	47,500	41,000	33,500	24,000	
2 1/2	149.0	133,000	26,500	13,500	53,000	46,000	37,500	26,500	
2 5/8	168.0	153,900	31,000	15,500	61,500	53,500	43,500	31,000	

[Order 74-26, § 296-155-335 (part), Table F-16 (codified as WAC 296-155-34916), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34917 Table F-17.

**TABLE F-17**  
POLYESTER ROPE SLINGS

**TABLE F-17: PART 1—Eye and Eye Sling**

ROPE Diameter Nominal Inches		Nominal weight per 100 ft Pounds		Minimum Strength Break-ing in Pounds		Vertical Hitch		RATED CAPACITY IN POUNDS (Safety Factor = 9)				
								EYE AND EYE SLING				
								BASKET HITCH				
								Angle of Rope to Horizontal				
								90 deg	60 deg	45 deg	30 deg	
								Angle of Rope to Vertical				
								Chok-er Hitch	0 deg	30 deg	45 deg	60 deg
1/2	8.0	6,080	700	350	1,400	1,200	950	700				
9/16	10.2	7,600	850	400	1,700	1,500	1,200	850				
5/8	13.0	9,500	1,100	550	2,100	1,800	1,500	1,100				
3/4	17.5	11,875	1,300	650	2,600	2,300	1,900	1,300				
1 3/16	21.0	14,725	1,600	800	3,300	2,800	2,300	1,600				
7/8	25.0	17,100	1,900	950	3,800	3,300	2,700	1,900				
1	30.5	20,900	2,300	1,200	4,600	4,000	3,300	2,300				
1 1/16	34.5	24,225	2,700	1,300	5,400	4,700	3,800	2,700				
1 1/8	40.0	28,025	3,100	1,600	6,200	5,400	4,400	3,100				
1 1/4	46.3	31,540	3,500	1,800	7,000	6,100	5,000	3,500				
1 5/16	52.5	35,625	4,000	2,000	7,900	6,900	5,600	4,000				
1 1/2	66.8	44,460	4,900	2,500	9,900	8,600	7,000	4,900				
1 5/8	82.0	54,150	6,000	3,000	12,000	10,400	8,500	6,000				
1 3/4	98.0	64,410	7,200	3,600	14,500	12,500	10,000	7,200				
2	118.0	76,000	8,400	4,200	17,000	14,500	12,000	8,400				
2 1/8	135.0	87,400	9,700	4,900	19,500	17,000	13,500	9,700				
2 1/4	157.0	101,650	11,500	5,700	22,500	19,500	16,000	11,500				
2 1/2	181.0	115,900	13,000	6,400	26,000	22,500	18,000	13,000				
2 5/8	205.0	130,150	14,500	7,200	29,000	25,000	20,500	14,500				

TABLE F-17: PART 2—Endless Sling

ROPE Diameter Nominal Inches		Nominal weight per 100 ft Pounds		Minimum Strength Break-ing in Pounds		Vertical Hitch		RATED CAPACITY IN POUNDS (Safety Factor = 9)				
								ENDLESS SLING				
								BASKET HITCH				
								Angle of Rope to Horizontal				
								90 deg	60 deg	45 deg	30 deg	
								Angle of Rope to Vertical				
								Chok-er Hitch	0 deg	30 deg	45 deg	60 deg
1/2	8.0	6,080	1,200	600	2,400	2,100	1,700	1,200				
9/16	10.2	7,600	1,500	750	3,000	2,600	2,200	1,500				
5/8	13.0	9,500	1,900	950	3,800	3,300	2,700	1,900				
3/4	17.5	11,875	2,400	1,200	4,800	4,100	3,400	2,400				
1 3/16	21.0	14,725	2,900	1,500	5,900	5,100	4,200	2,900				
7/8	25.0	17,100	3,400	1,700	6,800	5,900	4,800	3,400				
1	30.5	20,900	4,200	2,100	8,400	7,200	5,900	4,200				
1 1/16	34.5	24,225	4,800	2,400	9,700	8,400	6,900	4,800				
1 1/8	40.0	28,025	5,600	2,800	11,000	9,700	7,900	5,600				
1 1/4	46.3	31,540	6,300	3,200	12,500	11,000	8,900	6,300				
1 5/16	52.5	35,625	7,100	3,600	14,500	12,500	10,000	7,100				
1 1/2	66.8	44,460	8,900	4,400	18,000	15,500	12,500	8,900				
1 5/8	82.0	54,150	11,000	5,400	21,500	19,000	15,500	11,000				
1 3/4	98.0	64,410	13,000	6,400	26,000	22,500	18,000	13,000				
2	118.0	76,000	15,000	7,600	30,500	26,500	21,500	15,000				
2 1/8	135.0	87,400	17,500	8,700	35,000	30,500	24,500	17,500				
2 1/4	157.0	101,650	20,500	10,000	40,500	35,000	29,000	20,500				
2 1/2	181.0	115,900	23,000	11,500	46,500	40,000	33,000	23,000				
2 5/8	205.0	130,150	26,000	13,000	52,000	45,000	37,000	26,000				

[Order 74-26, § 296-155-335 (part), Table F-17 (codified as WAC 296-155-34917), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34918 Table F-18.

**TABLE F-18**  
POLYPROPYLENE ROPE SLINGS

**TABLE F-18: PART 1—Eye and Eye Sling**

ROPE Diameter Nominal Inches		Nominal weight per 100 ft Pounds		Minimum Strength Break-ing in Pounds		Vertical Hitch		RATED CAPACITY IN POUNDS (Safety Factor = 6)				
								EYE AND EYE SLING				
								BASKET HITCH				
								Angle of Rope to Horizontal				
								90 deg	60 deg	45 deg	30 deg	
								Angle of Rope to Vertical				
								Chok-er Hitch	0 deg	30 deg	45 deg	60 deg
1/2	4.7	3,990	650	350	1,300	1,200	950	65				
9/16	6.1	4,845	800	400	1,600	1,400	1,100	800				
5/8	7.5	5,890	1,000	500	2,000	1,700	1,400	1,000				
3/4	10.7	8,075	1,300	700	2,700	2,300	1,900	1,300				
13/16	12.7	9,405	1,600	800	3,100	2,700	2,200	1,600				
7/8	15.0	10,925	1,800	900	3,600	3,200	2,600	1,800				
1	18.0	13,300	2,200	1,100	4,400	3,800	3,100	2,200				
1 1/16	20.4	15,200	2,500	1,300	5,100	4,400	3,600	2,500				
1 1/8	23.7	17,385	2,900	1,500	5,800	5,000	4,100	2,900				
1 1/4	27.0	19,950	3,300	1,700	6,700	5,800	4,700	3,300				
1 5/16	30.5	22,325	3,700	1,900	7,400	6,400	5,300	3,700				
1 1/2	38.5	28,215	4,700	2,400	9,400	8,100	6,700	4,700				
1 5/8	47.5	34,200	5,700	2,900	11,500	9,900	8,100	5,700				
1 3/4	57.0	40,850	6,800	3,400	13,500	12,000	9,600	6,800				
2	69.0	49,400	8,200	4,100	16,500	14,500	11,500	8,200				
2 1/8	80.0	57,950	9,700	4,800	19,500	16,500	13,500	9,700				
2 1/4	92.0	65,550	11,000	5,500	22,000	19,000	15,500	11,000				
2 1/2	107.0	76,000	12,500	6,300	25,500	22,000	18,000	12,500				
2 5/8	120.0	85,500	14,500	7,100	28,500	24,500	20,000	14,500				

TABLE F-18: PART 2—Endless Sling

ROPE Diameter Nominal Inches		Nominal weight per 100 ft Pounds		Minimum Strength Break-ing in Pounds		Vertical Hitch		RATED CAPACITY IN POUNDS (Safety Factor = 6)				
								ENDLESS SLING				
								BASKET HITCH				
								Angle of Rope to Horizontal				
								90 deg	60 deg	45 deg	30 deg	
								Angle of Rope to Vertical				
								Chok-er Hitch	0 deg	30 deg	45 deg	60 deg
1/2	4.7	3,990	1,200	600	2,400	2,100	1,700	1,200				
9/16	6.1	4,845	1,500	750	3,000	2,600	2,200	1,500				
5/8	7.5	5,890	1,800	900	3,500	3,100	2,500	1,800				
3/4	10.7	8,075	2,400	1,200	4,900	4,200	3,400	2,400				
1 3/16	12.7	9,405	2,800	1,400	5,600	4,900	4,000	2,800				
7/8	15.0	10,925	3,300	1,600	6,600	5,700	4,600	3,300				
1	18.0	13,300	4,000	2,000	8,000	6,900	5,600	4,000				
1 1/16	20.4	15,200	4,600	2,300	9,100	7,900	6,500	4,600				
1 1/8	23.7	17,385	5,200	2,600	10,500	9,000	7,400	5,200				
1 1/4	27.0	19,950	6,000	3,000	12,000	10,500	8,500	6,000				
1 5/16	30.5	22,325	6,700	3,400	13,500	11,500	9,500	6,700				
1 1/2	38.5	28,215	8,500	4,200	17,000	14,500	12,000	8,500				
1 5/8	47.5	34,200	10,500	5,100	20,500	18,000	14,500	10,500				
1 3/4	57.0	40,850	12,500	6,100	24,500	21,000	17,500	12,500				
2	69.0	49,400	15,000	7,400	29,500	25,500	21,000	15,000				
2 1/8	80.0	57,950	17,500	8,700	35,000	30,100	24,500	17,500				
2 1/4	92.0	65,550	19,500	9,900	39,500	34,000	28,000	19,500				
2 1/2	107.0	76,000	23,000	11,500	45,500	39,500	32,500	23,000				
2 5/8	120.0	85,500	25,500	13,000	51,500	44,500	36,500	25,500				

[Order 74-26, § 296-155-335 (part), Table F-18 (codified as WAC 296-155-34918), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34919 Table F-19.**

**TABLE F-19**  
SAFE WORKING LOADS FOR SHACKLES  
(In tons of 2,000 pounds)

Material size (inches)	Pin diameter (inches)	Safe working load
1/2	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/8	5.6
1 1/8	1 1/4	6.7
1 1/4	1 3/8	8.2
1 3/8	1 1/2	10.0
1 1/2	1 15/8	11.9
1 3/4	2	16.2
2	2 1/4	21.2

[Order 74-26, § 296-155-335 (part), Table F-19 (codified as WAC 296-155-34919), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34920 Table F-20.**

**TABLE F-20**  
NUMBER AND SPACING OF U-BOLT  
WIRE ROPE CLIPS

Improved plow steel	Number of Clips		Minimum spacing (inches)
	Drop forged		
3/8 and under	2		3
1/2	3		3
5/8	3		3
3/4	4		4 1/2
7/8	4		5 1/4
1	5		6
1 1/8	6		7
1 1/4	6		8
1 3/8	7		9
1 1/2	7		10

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-34920, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34920, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-20 (codified as WAC 296-155-34920), filed 5/7/74, effective 6/6/74.]

**PART G**  
**TOOLS—HAND AND POWER**

**WAC 296-155-350 General requirements.** (1) Condition of tools. All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition.

(2) Guarding.

(a) When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.

(b) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard. Guarding shall meet the requirements as set forth in American National Standards Institute, B15.1-1953 (R1958), Safety Code for Mechanical Power-Transmission Apparatus.

(3) Personal protective equipment. Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall use the particular personal protective equipment necessary to protect them

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from the hazard. All personal protective equipment shall meet the requirements and be maintained according to Parts B and C of this chapter.

(4) Switches.

(a) Scope. This subsection does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools.

(b) All hand-held powered platen sanders, grinders with wheels 2-inch diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jigsaws with blade shanks one-fourth of an inch wide or less may be equipped with only a positive "on-off" control.

(c) All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools shall be equipped with a momentary contact "on-off" control and may have a lock-on control provided that turn-off can be accomplished by a single motion of the same finger or fingers that turn it on.

(d) All other hand-held powered tools, such as circular saws, chain saws, and percussion tools, shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

(e) Disconnect switches. All fixed power driven tools shall be provided with a disconnect switch that can either be locked or tagged in the off position.

(f) Self-feed. Automatic feeding devices shall be installed on machines whenever the nature of the work will permit. Feeder attachments shall have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points.

[Order 74-26, § 296-155-350, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-355 Hand tools.** (1) Employers shall not issue or permit the use of unsafe hand tools.

(2) Wrenches, including adjustable, pipe, end, and socket wrenches shall not be used when jaws are sprung or worn to the point that slippage occurs.

(3) Nails shall not be cut with an axe.

(4) Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

(5) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-355, filed 1/21/86; Order 74-26, § 296-155-355, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-360 Power-operated hand tools.** (1) Electric power-operated tools.

(a) Electric power operated tools shall either be of the approved double-insulated type or grounded in accordance with Part I of this chapter.

(b) The use of electric cords for hoisting or lowering tools shall not be permitted.

(2) Pneumatic power tools.

(a) Pneumatic power tools and hose sections shall be secured by threaded couplings, quick disconnect couplings or by 100 pound tensile strength safety chain or equivalent across each connection to prevent the tool or hose connections from becoming accidentally disconnected.

(b) Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

(c) All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

EXCEPTION: Pneumatic nailers or staplers utilizing "fine wire" brads or staples do not require a muzzle contact safety device, provided:

(1) The overall weight of the fastening device does not exceed the weight of standard 18 gauge wire, 1-1/2 inches long.

(2) The operator and any other person within 12 feet of the point of operation wear approved eye protection.

Note: The normal maximum diameter tolerance for manufacturing standard 18 gauge wire is .045 inches.

(d) Compressed air shall not be used at the nozzle for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and personal protective equipment which meets the requirements of Part C of this chapter.

Note: The above requirement does not apply to concrete form, mill scale and similar cleaning purposes. Concrete form, mill scale, and similar cleaning may be performed with air pressure exceeding 30 p.s.i. provided the nozzle and/or cleaning pipe is at least three feet long with a quick-closing (deadman) valve between the hose and the nozzle or pipe. The operator and all other employees within range of flying debris shall be protected by eye or face protection as specified in WAC 296-155-215.

(e) The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

(f) The use of hoses for hoisting or lowering tools shall not be permitted.

(g) All hoses exceeding 1/2-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

(h) Airless spray guns of the type which atomize paints and fluids at high pressures (1,000 pounds or more per square inch) shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released.

(i) In lieu of the above, a diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection, shall be provided.

(j) Abrasive blast cleaning nozzles. The blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

(3) Fuel powered tools.

(a) All fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with Part D of this chapter.

(b) When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases

and use of personal protective equipment as outlined in Parts B and C of this chapter shall apply.

(4) Hydraulic power tools.

(a) The fluid used in hydraulic powered tools shall be fire resistant fluid approved under schedule 30 of the Bureau of Mines, U.S. Department of the Interior, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

(b) The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-360, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-360, filed 1/21/86; Order 76-29, § 296-155-360, filed 9/30/76; Order 76-6, § 296-155-360, filed 3/1/76; Order 74-26, § 296-155-360, filed 5/7/74, effective 6/6/74.]

### **WAC 296-155-363 Safety requirements for powder actuated fastening systems, in accordance with ANSI A10.3-1985, Safety Requirements for Powder Actuated Fastening Systems.**

[Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-155-363, filed 5/20/91, effective 6/20/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-363, filed 1/21/86.]

**WAC 296-155-36301 Scope.** This standard provides safety requirements for a powder actuated fastening tool or machine which propels a stud, pin, fastener, or other object for the purpose of affixing it by penetration to another object.

This standard does not apply to devices designed for attaching objects to soft construction materials, such as wood, plaster, tar, dry wallboard, and the like, or to stud welding equipment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36301, filed 1/21/86.]

**WAC 296-155-36303 Purpose.** The purpose of this standard is to provide reasonable safety for life, limb, and property, by establishing requirements for design, construction, operation, service, and storage of powder actuated fastening tools, fasteners and power loads.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36303, filed 1/21/86.]

**WAC 296-155-36305 Definitions applicable to this section.** (1) Angle control - a safety feature designed to prevent a tool from operating when tilted beyond a predetermined angle.

(2) Approved - meeting the requirements of this standard and acceptable to the department of labor and industries.

(3) Cased power load - a power load with the propellant contained in a closed case.

(4) Caseless power load - a power load with the propellant in solid form not requiring containment.

(5) Chamber (noun) - the location in the tool into which the power load is placed and in which it is actuated.

(6) Chamber (verb) - to fit the chamber according to manufacturer's specifications.

(7) Fasteners - any pins (unthreaded heads) or studs (threaded heads) driven by powder actuated tools.

(8) Fixture - a special shield that provides equivalent protection where the standard shield cannot be used.

(9) Head - that portion of a fastener that extends above the work surface after being properly driven.

(10) Misfire - a condition in which the power load fails to ignite after the tool has been operated.

(11) Powder actuated fastening system - a method comprising the use of a powder actuated tool, a power load, and a fastener.

(12) Powder actuated tool (also known as tool) - a tool that utilizes the expanding gases from a power load to drive a fastener.

(13) Power load - the energy source used in powder actuated tools.

(14) Qualified operator - a person who meets the requirements of WAC 296-155-36321 (1) and (2).

(15) Shield - a device, attached to the muzzle end of a tool, which is designed to confine flying particles.

(16) Spalled area - a damaged and nonuniform concrete or masonry surface.

(17) Test velocity - the measurement of fastener velocity performed in accordance with WAC 296-155-36307 (1)(m).

(18) Tools - tools can be divided into two types: Direct acting and indirect acting; and three classes: Low velocity, medium velocity, and high velocity.

(a) Direct acting tool - a tool in which the expanding gas of the power load acts directly on the fastener to be driven.

(b) Indirect acting tool - a tool in which the expanding gas of the power load acts on a captive piston, which in turn drives the fastener.

(c) Low-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for that specific tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from the ten tests not in excess of 100 meters per second (328 feet per second) with no single test having a velocity of over 108 m/s (354 ft/s).

(d) Medium-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from ten tests in excess of 100 m/s (328 ft/s) but not in excess of 150 m/s (492 ft/s) with no single test having a velocity of 160 m/s (525 ft/s).

(e) High-velocity tool - a tool whose test velocity has been measured ten times while utilizing the combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load which will properly chamber in the tool; that will produce an

average velocity from the ten tests in excess of 150 m/s (492 ft/s).

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-36305, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-36305, filed 1/21/86.]

**WAC 296-155-36307 Requirements.** (1) General.

(a) The tool shall be designed to prevent inadvertent actuation.

(b) The tool shall be designed to prevent actuation when dropped in any attitude from a height of 3 meters (10 ft) onto a smooth, hard surface such as concrete or steel, if such actuation can propel a fastener or any part thereof in free flight.

(c) Actuation of the tool shall be dependent upon at least two separate and distinct operations by the operator, with at least one operation being separate from the operation of holding the tool against the work surface.

(d) The tool shall be designed not to be operable other than against a work surface with a force on the work surface equal to 22 newtons (5 lb) greater than the weight of the tool or a minimum impact energy of 4 joules (3 ft-lb).

(e) All tools shall be designed so that compatible protective shields or fixtures, designed, built, and supplied by the manufacturer of the tool, can be used (see WAC 296-155-36307 (2)(b), (3)(b), (4)(b) and 296-155-36313(8)).

(f) The tool shall be designed so that a determinable means of varying the power levels is available for selecting a power level adequate to perform the desired work (see WAC 296-155-36309(5)).

(g) The tool shall be designed so that all principal functional parts can be checked for foreign matter that may affect operation.

(h) The tool shall be designed so that all parts will be of adequate strength to resist maximum stresses imposed upon actuation when the tool is used in accordance with the manufacturer's instructions and is powered by any commercially available power load which will properly chamber in the tool.

(i) Each tool shall bear a legible permanent model designation, which shall serve as a means of identification. Each tool shall also bear a legible, permanent manufacturer's unique serial number.

(j) A lockable container shall be provided for each tool. The words "POWDER ACTUATED TOOL" shall appear in plain sight on the outside of the container. The following notice shall be attached on the inside cover of the container:

"WARNING - POWDER ACTUATED TOOL. TO BE USED ONLY BY A QUALIFIED OPERATOR AND KEPT UNDER LOCK AND KEY WHEN NOT IN USE."

(k) Each tool shall bear a durable warning label with the following statement, or the equivalent:

"WARNING - FOR USE ONLY BY QUALIFIED OPERATORS ACCORDING TO MANUFACTURER'S INSTRUCTION MANUAL."

(l) Each tool shall be supplied with the following:

(i) Operator's instruction and service manual.

(ii) Power load chart.

(iii) Tool inspection record.

(iv) Service tools and accessories.

(m) In determining tool test velocities, the velocity of the fastener shall be measured in free flight at a distance of 2 meters (6-1/2 ft) from the muzzle end of the tool, using accepted ballistic test methods.

(2) Design requirements - low-velocity class.

(a) Low-velocity tools, indirect-acting (piston) type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) A shield shall be supplied with each tool.

(3) Design requirements - medium-velocity class.

(a) Medium-velocity tools, indirect-acting (piston) type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) The tool shall have a shield at least 63 mm (2-1/2 in) in diameter mounted perpendicular to, and concentric with, the muzzle end, when it is indexed to the center position. A special shield or fixture may be used when it provides equivalent protection.

(c) The tool shall be designed so that it cannot be actuated unless it is equipped with a shield or fixture.

(d) The tool shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position if the bearing surface of the shield is tilted more than 12 degrees from a flat surface.

(4) Design requirements - high-velocity class.

(a) High-velocity tools, direct-acting or indirect-acting type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) The tool shall have a shield at least 88 mm (3-1/2 in) in diameter mounted perpendicular to, and concentric with, the muzzle end, when it is indexed to the center position. A special shield or fixture may be used when it provides equivalent protection.

(c) The tool shall be designed so that it cannot be actuated unless it is equipped with a shield or fixture.

(d) The tool shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position, if the bearing surface of the shield is tilted more than eight degrees from a flat surface.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36307, filed 1/21/86.]

**WAC 296-155-36309 Power loads.** (1) Identification of cased power loads. Cased power loads shall be coded to identify power load levels by case color and power load color as specified in Table G-1.

(2) Identification of caseless power loads. Caseless power loads shall be coded to identify power load levels by power load color as specified in Table G-1 and by configuration.

(3) Power load use limitation. No power load (cased or caseless) shall be used if it will properly chamber in any existing commercially available tool and will cause a fastener to have a test velocity in excess of the maximum test velocities specified for the said tool.

(4) Identification of power load packages. Power load packages shall provide a visual number-color indication of the power level of the power load as specified in Table G-1.

**TABLE G-1**  
**Power Load Identification**

Power Level	Color Identification		Nominal velocity	
	Case Color	Load Color	Meters per Second (± 13.5)	Feet per Second (± 45)
1	Brass	Gray	91	300
2	Brass	Brown	119	390
3	Brass	Green	146	480
4	Brass	Yellow	174	570
5	Brass	Red	201	660
6	Brass	Purple	229	750
7	Nickel	Gray	256	840
8	Nickel	Brown	283	930
9	Nickel	Green	311	1020
10	Nickel	Yellow	338	1110
11	Nickel	Red	366	1200
12	Nickel	Purple	393	1290

Note: The nominal velocity applies to a 9.53 mm (3/8-in) diameter 22.7-gram (350-grain) ballistic slug fired in a test device and has no reference to actual fastener velocity developed in any specific tool.

(5) Optional power load variation. Where means other than power loads of varying power levels are to be used to control penetration, such means shall provide an equivalent power level variation.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36309, filed 1/21/86.]

**WAC 296-155-36311 Fasteners.** Fasteners for use in powder actuated tools shall be designed and manufactured to function compatibly with these tools and, when used in masonry, concrete, or steel, to effect properly the application for which they are recommended.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36311, filed 1/21/86.]

**WAC 296-155-36313 Operation.** (1) Acceptable tools. Only tools meeting the requirements of this standard shall be used.

(2) Qualified operators. Only qualified operators shall operate tools.

(3) Use lowest velocity. The lowest velocity class of tool that will properly set the fastener shall be used.

(4) Operating limitations. Tools shall be operated in strict accordance with the manufacture's instructions.

(5) Personal protection. Eye or face protection, or both, shall be worn by operators, assistants, and adjacent personnel when tool is in use. Hearing protection shall be used when making fastenings in confined areas.

(6) Daily inspections. Each day, prior to use, the operator shall inspect the tool to determine that it is in proper working condition in accordance with the testing methods recommended by the manufacture of the tool.

(7) Defective tools. Any tool found not to be in proper working condition shall be immediately removed from service and tagged "DEFECTIVE"; it shall not be used until it has been properly repaired in accordance with the manufacture's instructions.

(8) Proper accessories. The proper shield, fixture, adapter, or accessory, suited for the application, as recommended and supplied by the manufacture, shall be used.

(9) Proper loads and fasteners. Only those types of fasteners and power loads recommended by the tool manufacturer for a particular tool, or those providing the same level of safety and performance, shall be used.

(10) Questionable material. Before fastening into any questionable material, the operator shall determine its suitability by using a fastener as a center punch. If the fastener point does not easily penetrate, is not blunted, and does not fracture the material, initial test fastenings shall then be made in accordance with the tool manufacturer's recommendations. (See WAC 296-155-36315(3).)

(11) Tool safety. No tool shall be loaded unless it is being prepared for immediate use. If the work is interrupted after loading, the tool shall be unloaded at once.

(12) Powder actuated magazine or clip-fed tools are not considered loaded unless a power load is actually in the ram (firing chamber), even though the magazine or clip is inserted in the tool. If work is interrupted, the firing chamber shall be cleared and the magazine or clip removed.

(13) Pointing tools. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any person; hands shall be kept clear of the open barrel end.

(14) Tool perpendicular to work. The tool shall always be held perpendicular to the work surface when fastening into any material, except for specific applications recommended by the tool manufacturer.

(15) Misfires. In the event of a misfire, the operator shall hold the tool firmly against the work surface for a period of thirty seconds and then follow the explicit instructions set forth in the manufacturer's instructions.

(16) Different power levels. Power loads of different power levels and types shall be kept in separate compartments or containers.

(17) Signs. A sign, at least 20 x 25 cm (8 x 10 in), using boldface type no less than 2.5 cm (1 in) in height, shall be posted in plain sight on all construction projects where tools are used. The sign shall bear wording similar to the following: "POWDER ACTUATED TOOL IN USE."

[Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-155-36313, filed 5/20/91, effective 6/20/91; 89-11-035 (Order 89-03), § 296-155-36313, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36313, filed 1/21/86.]

**WAC 296-155-36315 Limitations of use.** (1) Explosive and flammable atmospheres. The tool shall not be used in an explosive or flammable atmosphere.

(2) Unattended tools prohibited. A tool shall never be left unattended in a place where it would be available to unauthorized persons.

(3) Fasteners in hard, brittle areas. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, hardened steel, glass block, natural rock, hollow tile, or most brick. (See WAC 296-155-36313(10).)

(4) Fasteners in soft materials. Fasteners shall not be driven into easily penetrated or thin materials, or materials of questionable resistance, unless backed by a material that will prevent the fastener from passing completely through the other side.

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(5) Fasteners in steel. Fasteners shall not be driven closer than 13 mm (1/2 in) from the edge of steel except for specific applications recommended by the tool manufacturer.

(6) Fasteners in masonry. Fasteners shall not be driven closer than 7.5 cm (3 in) from the unsupported edge of masonry materials except for specific applications recommended by the tool manufacturer.

(7) Fasteners in concrete. Fasteners shall not be driven into concrete unless material thickness is at least three times the fastener shank penetration.

(8) Fasteners in spalls. Fasteners shall not be driven into any spalled area.

(9) Fasteners in existing holes. Fasteners shall not be driven through existing holes unless a specific guide means, as recommended and supplied by the tool manufacturer, is used to ensure positive alignment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36315, filed 1/21/86.]

**WAC 296-155-36317 Maintenance and storage.** (1)

Use of tools. The tool shall be serviced and inspected for worn or damaged parts at regular intervals as recommended by the tool manufacturer. Prior to the tool being put back into use, all worn or damaged parts shall be replaced by a qualified person using only parts supplied by the tool manufacturer. A record of this inspection shall be noted and dated on the tool inspection record.

(2) Instruction manuals. Instruction manuals, maintenance tools, and accessories supplied with the tool shall be stored in the tool container when not in use.

(3) Security. Powder actuated tools and power loads shall be locked in a container and stored in a safe place when not in use and shall be accessible only to authorized personnel.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36317, filed 1/21/86.]

**WAC 296-155-36319 Authorized instructor.** (1)

Operator qualifications. Only persons trained and authorized by the tool manufacturer or by an authorized representative of the tool manufacturer shall be qualified to instruct and qualify operators for the manufacturer's powder actuated tools.

(2) Instructor qualifications. All authorized instructors shall have read and be familiar with this standard, and shall be capable of:

(a) Disassembling, servicing, and reassembling the tool.

(b) Recognizing any worn or damaged parts or defective operation.

(c) Recognizing and clearly identifying the colors used to identify power load levels.

(d) Using the tool correctly within the limitations of its use.

(e) Training and testing operators prior to issuing a qualified operator's card.

(3) Instructor's card. All authorized instructors shall have in their possession a valid authorized instructor's card issued and signed by an authorized representative of the manufacturer. The card shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-1.

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(4) List of instructors. A list of all instructors authorized by the manufacturer to instruct and qualify operators shall be maintained by the tool manufacturer and be made available to the department of labor and industries.

(5) Revocation of instructor card. Instructor's card may be revoked by the authorizing agent or the department of labor and industries, if the instructor is known to have issued a qualified operator's card in violation of any regulation contained in this standard. When an instructor is no longer authorized to issue qualified operator's cards, cards shall be surrendered to the authorizing agent or the department of labor and industries.

AUTHORIZED INSTRUCTOR

..... Powder Actuated Tools    Date .....

(MAKE)

Card No. ....    Social Security No. ....

This certifies that .....

(NAME OF INSTRUCTOR)

has received the prescribed training in the operation and maintenance of powder actuated tools manufactured by .....

(NAME OF MANUFACTURER)

to train and certify operators of .....

(MAKE)

powder actuated tools.

Model(s) .....

Authorized by .....

I have received instruction by the manufacturer's authorized representative in the training of operators of the above tools and agree to conform to all rules and regulations governing the instruction of tool operators.

Date of Birth .....

.....

(SIGNATURE)

**Figure G-1**

Sample of Authorized Instructor's Card

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-36319, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36319, filed 1/21/86.]

**WAC 296-155-36321 Qualified operator.** (1) Operator qualifications. The operator shall be trained by an authorized instructor to be familiar with the provisions of this standard and the instructions provided by the manufacturer for operation and maintenance. The operator shall also be capable of:

- (a) Reading and understanding the manufacturer's instruction manual.
- (b) Cleaning the tool correctly.
- (c) Recognizing any worn or damaged parts or defective operation.
- (d) Recognizing the number-color code system used in this standard to identify power load levels. In the event the operator is unable to distinguish the colors used, the operator shall be given special instruction which will enable the operator to avoid error.
- (e) Using a tool correctly within the limitations of its use and demonstrate competence by operating the tool in the presence of the instructor.

(2) Operator examination. After training, the operator shall substantiate competency by completing satisfactorily a written examination provided by the manufacturer of the tool.

(a) The operator's written examination shall consist of questions to establish the operator's competence with respect to:

- (i) The requirements of this standard;

- (ii) The powder actuated fastening system; and
- (iii) The specific details of operation and maintenance of the tool(s) involved.

(b) The examination shall provide a statement, attested to by the instructor, that the applicant can (or cannot) readily distinguish the colors used to identify power load levels (see WAC 296-155-36309).

(3) Operator's card. Each applicant who meets the requirements as set forth in subsections (1) and (2) of this section shall receive a qualified operator's card, issued and signed by both the instructor and applicant. While using the tool, the operator shall carry this card.

(4) Card features. The qualified operator's card supplied by the manufacturer shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-2.

(5) Revocation notation. There shall be printed on the card a notation reading:

"Revocation of card - Failure to comply with any of the rules and regulations for safe operation of powder actuated fastening tools shall be cause for the immediate revocation of this card."

QUALIFIED OPERATOR

..... Powder Actuated Tools    Date .....

(MAKE)

Card No. ....    Social Security No. ....

This certifies that .....

(NAME OF OPERATOR)

has received the prescribed training in the operation of powder actuated tools manufactured by .....

(NAME OF MANUFACTURER)

Model(s) .....

Trained and issued by .....

(SIGNATURE OF AUTHORIZED INSTRUCTOR)

I have received instruction in the safe operation and maintenance of powder actuated fastening tools of the makes and models specified and agree to conform to all rules and regulations governing that use

Date of Birth .....

.....

(SIGNATURE)

**Figure G-2**

Sample of Qualified Operation's Card

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-36321, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36321, filed 1/21/86.]

**WAC 296-155-365 Abrasive wheels and tools.** (1) Power. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation.

(2) Guarding.

(a) Grinding machines shall be equipped with safety guards in conformance with the requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

(b) Guard design. The safety guard shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard, except:

(i) Safety guards on all operations where the work provides a suitable measure of protection to the operator, may be so constructed that the spindle end, nut, and outer flange are exposed; and where the nature of the work is such as to entirely cover the side of the wheel, the side covers of the guard may be omitted; and

(ii) The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(3) Use of abrasive wheels.

(a) Floor stand and bench mounted abrasive wheels, used for external grinding, shall be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel periphery and sides shall be not more than 90°, except that when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125°. In either case, the exposure shall begin not more than 65° above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the effect of a bursting wheel.

(b) Floor and bench-mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be adjusted to a distance not to exceed one-eighth inch from the surface of the wheel. The work rest may be omitted when contacts of the work piece with the grinding surface below the horizontal plane of the spindle are necessary and unavoidable, or where the size or shape of the work piece precludes use of the work rest.

(c) Cup type wheels used for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the American National Standards Institute, B7.1-1978, Safety Requirements for the Use, Care, and Protection of Abrasive Wheels. Abrasive wheels shall only be used on machines provided with safety guards, except the following:

(i) Wheels used for internal work while within the work being ground.

(ii) Mounted wheels, 2 inches and smaller in diameter used in portable operations.

(iii) Types 16, 17, 18, 18R and 19 cones and plugs, and threaded hole pot balls where the work offers protection or where the size does not exceed 3 inches in diameter by 5 inches in length.

(iv) Metal centered diamond lapidary wheels either notched, segmented or continuous rim used with a coolant deflector, when operated at speeds up to 3500 surface feet per minute (S.F.P.M.).

(v) Type 1 wheels not larger than 2 inches in diameter and not more than 1/2 inch thick, operating at peripheral speeds less than 1800 SFPM when mounted on mandrels driven by portable drills.

(vi) Type 1 reinforced wheels not more than 3 inches in diameter and 1/4 inch in thickness, operating at peripheral speeds not exceeding 9500 SFPM, provided that safety glasses and face shield are worn.

(vii) Valve seat grinding wheels.

(d) Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) meeting the requirements of subdivision (f) of this subsection, except as follows:

(i) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used;

(ii) If the wheel is entirely within the work being ground while in use.

(e) When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180°.

(f) When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of accidental breakage, shall be used.

(g) All abrasive wheels shall be closely inspected and ring-tested before mounting to ensure that they are free from cracks or defects.

(h) Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.

(i) All employees using abrasive wheels shall be protected by eye protection equipment in accordance with the requirements of Part C of this chapter, except when adequate eye protection is afforded by eye shields which are permanently attached to the bench or floor stand.

(4) Other requirements. All abrasive wheels and tools used by employees shall meet other applicable requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-365, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-365, filed 1/21/86; Order 74-26, § 296-155-365, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-367 Masonry saws.** (1) Guarding.

(a) Masonry saws shall be guarded by semicircular enclosures over the blade.

(b) A method for retaining blade fragments shall be incorporated into the design of the semicircular enclosure.

(2) Safety latch. A safety latch shall be installed on notched saws to prevent the motor and cutting head assembly from lifting out of the notches.

(3) Blade speed. Blade speed shall be maintained in accordance with the manufacturer's specifications.

(4) Exhaust and eye protection.

(a) All table mounted masonry saws shall be equipped with a mechanical means of exhausting dust into a covered receptacle or be provided with water on the saw blade for dust control. The operator and any nearby worker shall wear appropriate eye protection in accordance with WAC 296-155-215.

(b) All portable hand-held masonry saw operators shall wear appropriate eye and respiratory protection in accordance with WAC 296-155-215 and chapter 296-842 WAC.

(5) Grounding. The motor frames of all stationary saws shall be grounded through conduit, water pipe, or a driven ground. Portable saws shall be grounded through three-pole cords attached to grounded electrical systems.

(6) Inspection. Masonry saws shall be inspected at regular intervals and maintained in safe operating condition.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-155-367, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-10-071, § 296-155-367, filed 5/4/99, effective 9/1/99. Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-155-367, filed 8/13/90, effective 9/24/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-367, filed 1/21/86.]

**WAC 296-155-370 Woodworking tools.** (1) Speeds.

No saw shall be operated in excess of the manufacturers recommended speed.

(2) Guarding. All portable, hand held power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

(3) Hand-fed table saws.

(a) Each circular hand-fed table saw shall be provided with a hood-type guard that will cover the blade at all times when the blade is not in use. This may be accomplished by the use of a guard that will automatically adjust to the thickness of the material being cut, or by a fixed or manually adjusted guard. If a fixed or manually adjusted guard is used, the space between the bottom of the guard and the material being cut shall not exceed 3/8 inch if 1-1/2 inches or more from the blade, and 1/4 inch if closer than 1-1/2 inches.

(b) When the blade is in use, the hood-type guard shall enclose that portion of the blade above the material.

(c) Hood-type guards shall be so designed and constructed as to resist blows and strains incidental to reasonable operation, adjusting, and handling, in order to protect the operator from flying splinters and broken saw teeth.

(d) The hood shall be so mounted as to ensure that its operation will be positive, reliable, and in alignment with the saw. The mounting shall be adequate to resist any reasonable side thrust or other force that would disrupt alignment.

(e) Where a hood-type guard cannot be used because of unusual shapes or cuts, a jig or fixture that will provide equal safety for the operator shall be used. On the completion of such operations, the guard shall be immediately replaced.

(f) A push stick shall be used on short or narrow stock when there is a possibility of the hand contacting the cutting tool.

(g) Each hand-fed circular rip saw shall be equipped with a spreader to minimize the possibility of material squeezing the saw or of material kickbacks. The spreader shall be made of tempered steel, or its equivalent, and shall be slightly thinner than the saw kerf. It shall be of sufficient width to provide adequate stiffness or rigidity to resist any reasonable side thrust or blow tending to bend or throw it out of position. The spreader shall be attached so that it will remain in true alignment with the blade, even when either the saw or table is tilted, and should be placed so that there is not more than 1/2-inch space between the spreader and the back of the blade when the recommended saw blade is in its maximum "up" position. If a blade smaller than the maximum permissible size is used, the spreader shall be moved to within 1/2 inch of

the blade. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required. On the completion of such operations, the spreader shall be immediately replaced.

(h) Each hand-fed circular rip saw shall be provided with antikickback devices so located as to oppose the thrust or tendency of the saw blade to pick up the material or throw it back toward the operator. These devices shall be designed to provide holding power for all the thicknesses of material being cut.

(4) Radial saws.

(a) Hoods and guards. Each saw shall be provided with a device that will completely enclose the upper portion of the blade down to a point that includes the end of the saw arbor. The upper hood shall be so constructed as to protect the operator from flying splinters and broken saw teeth, and to deflect sawdust away from the operator. The sides of the lower exposed portion of the saw blade shall be guarded from the tips of the blade teeth inward radially with no greater than 3/8-inch gullet exposure. The device shall automatically adjust itself to the thickness of the stock and remain in contact with the stock being cut for the 90° blade positions (0° bevel) throughout the full working range of miter position. A permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the guard visible from the normal operating position, reading as follows:

WARNING: TO AVOID INJURY, SHUT OFF POWER BEFORE CLEARING A JAMMED LOWER GUARD

Such a label shall be colored standard danger red or orange in accordance with American National Standard Safety Color Code for Marking Physical Hazards, Z53.1-1979.

(b) Spreaders. When radial saws are used for ripping, a spreader shall be provided and shall be aligned with the saw blade.

(c) Antikickback devices. Antikickback devices located on both sides of the saw blade on the outfeed side, so as to oppose the thrust or tendency of the blade to pick up the material or to throw it back toward the operator, shall be used on each radial saw used for ripping. These devices shall be designed to provide adequate holding power for all the thicknesses of material being cut.

(d) Adjustable stops and return devices. An adjustable stop shall be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut. A limit chain or other equally effective device shall be provided to prevent the saw blade from sliding beyond the edge of the table; or the table shall be extended to eliminate over-run.

(e) On any manually operated saw, installation shall be such that the front of the machine is slightly higher than the rear, or some other means shall be provided so that the cutting head will not roll or move out on the arm away from the column as a result of gravity or vibration. A permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the cutting head visible from the normal crosscut operating position, reading as follows:

WARNING: TO AVOID INJURY, RETURN CARRIAGE TO THE FULL REAR POSITION AFTER EACH CROSSCUT TYPE OF OPERATION

Such a label shall be colored standard caution yellow in accordance with American National Standard Z53.1-1979.

(f) Direction of feed. Ripping and ploughing shall be against the direction in which the saw blade turns. The direction of the saw blade rotation shall be conspicuously marked on the hoods. In addition, a permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the end of the guard at which the blade teeth exit the upper guard during operation. The label shall be at approximately the level of the arbor and shall read as follows:

DANGER: TO AVOID INJURY, DO NOT FEED MATERIAL INTO CUTTING TOOL FROM THIS END

Such a label shall be colored standard red or orange in accordance with American National Standard, Z53.1-1979.

(5) All woodworking tools and machinery shall meet any other applicable requirements of American National Standards Institute, 01.1-1971, Safety Code for Woodworking Machinery.

(6) The control switch on all stationary radial arm saws shall be placed at the front of the saw or table and shall be properly recessed or hooded to prevent accidental contact.

(a) A firm level working area shall be provided at the front of all stationary radial arm saws. The area shall be kept free of all stumbling hazards.

(b) A push stick or similar device shall be used for pushing short material through power saws.

(7) Circular power miter saws. The requirements of subsection (4)(a) of this section applies to guarding circular power miter saws.

(8) Personal protective equipment. All personal protective equipment required for use shall conform to the requirements of Part C of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-370, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-370, filed 1/21/86; Order 74-26, § 296-155-370, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-375 Jacks—Lever and ratchet, screw, and hydraulic.** General requirements.

(1) The manufacturer's rated capacity shall be legibly marked on all jacks and this capacity shall not be exceeded.

(2) All jacks shall have a positive stop to prevent over-travel.

(3) Specially designed jacks constructed for specific purposes shall meet the approval of the department of labor and industries before being placed in service.

(4) Control parts shall be so designed that the operator will not be subjected to hazard.

(5) Blocking. When it is necessary to provide a firm foundation, the base of the jack shall be blocked or cribbed. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load.

(6) Operation and maintenance.

(a) After the load has been raised, it shall immediately be cribbed, blocked, or otherwise secured.

(b) Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze liquid.

(c) All jacks shall be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should

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be followed, and only lubricants recommended by the manufacturer should be used.

(7) Each jack shall be thoroughly inspected at times which depend upon the service conditions. Inspections shall be not less frequent than the following:

(a) For constant or intermittent use at one locality, once every six months;

(b) For jacks sent out of shop for special work, when sent out and when returned;

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(8) Repair or replacement parts shall be examined for possible defects.

(9) Jacks which are out of order shall be tagged accordingly, and shall not be used until repairs are made.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-375, filed 7/20/94, effective 9/20/94; 93-04-111 (Order 92-15), § 296-155-375, filed 2/3/93, effective 3/15/93; 91-11-070 (Order 91-01), § 296-155-375, filed 5/20/91, effective 6/20/91; Order 74-26, § 296-155-375, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-380 Air receivers.** (1) Application. This section applies to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. On the other hand, however, this section does not deal with the special problems created by using compressed air to convey materials nor the problems created when persons work in compressed air as in tunnels and caissons. These standards are not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

(2) New and existing equipment.

(a) All new air receivers installed after the effective date of these standards shall be constructed in accordance with the 1968 Edition of the A.S.M.E. Boiler and Pressure Vessel Code, section VIII.

(b) All safety valves used shall be constructed, installed, and maintained in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, section VIII Edition 1968.

(3) Installation. Air receivers shall be so installed that all drains, handholes, and manholes therein are easily accessible. Air receivers should be supported with sufficient clearance to permit a complete external inspection and to avoid corrosion of external surfaces. Under no circumstances shall an air receiver be buried underground or located in an inaccessible place. The receiver should be located as close to the compressor or after-cooler as is possible in order to keep the discharge pipe short.

(4) Drains and traps. All air receivers having an internal and external operating pressure exceeding 15 psi with no limitation on size, and air receivers having an inside diameter exceeding six inches, with no limitation on pressure, if subject to corrosion, shall be supplied with a drain pipe and valve at the lowest point in the vessel; or a pipe may be used extending inward from any other location to within one-quarter inch of the lowest point. Adequate automatic traps may be installed in addition to drain valves. The drain valve on the air receiver shall be opened and the receiver completely drained

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frequently and at such intervals as to prevent the accumulation of oil and water in the receiver.

(5) Gages and valves.

(a) Every air receiver shall be equipped with an indicating pressure gage (so located as to be readily visible) and with one or more spring-loaded safety valves. The total relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than ten percent.

(b) No valve of any type shall be placed between the air receiver and its safety valve or valves.

(c) Safety appliances, such as safety valves, indicating devices and controlling devices, shall be constructed, located, and installed so that they cannot be readily rendered inoperative by any means, including the elements.

(d) All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-380, filed 7/20/94, effective 9/20/94.]

## PART H WELDING AND CUTTING

**WAC 296-155-400 Gas welding and cutting.** (1) Transporting, moving, and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secured.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard, or pallet. They shall not be hoisted or transported by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by powered vehicles, they shall be secured in a vertical position.

(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use. Such cylinders are not considered to be "in storage."

(h) When a job is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valve shall be closed.

(i) Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(j) Oxygen. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(2) Placing cylinders.

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

(3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by the owner, shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet the department of transportation requirements, Specification for Cylinders, (49 CFR Part 178, Subpart C).

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder shall be properly tagged and

removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the work area.

(g) Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while in service. In multiple cylinder installations one and only one key or handle is required for each manifold.

(5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least 1-inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe, well ventilated, and accessible locations. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches shall be covered by tape.

(c) All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.

(d) Hose which has been subject to flashback, or which shows evidence of severe wear or damage, shall be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the storage of gas hose shall be ventilated.

(g) Hoses, cables, and other equipment shall be kept clear of passageways, ladders and stairs.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

(b) Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Regulators and gauges. Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use.

(9) Oil and grease hazards. Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

(10) Additional rules. For additional details not covered in this Part, applicable portions of American National Standards Institute, Z49.1-1973, Safety in Welding and Cutting, shall apply.

You are also required to protect employees from exposure to hexavalent chromium during the stainless steel welding process. See WAC 296-62-08003, Hexavalent chromium for specific criteria.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-106, § 296-155-400, filed 8/1/06, effective 9/1/06. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-400, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-400, filed 1/21/86; Order 74-26, § 296-155-400, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-405 Arc welding and cutting.** (1) Manual electrode holders.

(a) Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.

(b) Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in the hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in need of repair shall not be used. When a cable, other than the cable lead referred to in subdivision (b)

of this subsection, becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than one unit, its safe current-carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return. For welding on natural gas pipelines, the technical portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines shall apply. (49 CFR Part 192, Subpart C.)

(c) When a structure or pipeline is employed as a ground return circuit, it shall be determined that the required electrical contact exist at all joints. The generation of an arc, sparks, or heat at any point shall cause rejection of the structures as a ground circuit.

(d) When a structure or pipeline is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water; to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(e) See WAC 296-155-452 for additional requirements.

(5) Shielding. Whenever practical, all arc welding and cutting operations shall be shielded by noncombustible or flameproof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

(6) Employee protection. Where welding or cutting operations are being performed in areas where it is possible for molten slag to contact other employees, those employees shall be protected from being burned by providing overhead protection, barricading the impact area, or other effective means.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-405, filed 7/20/94, effective 9/20/94; 88-23-054 (Order 88-25), § 296-155-405, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-405, filed 1/21/86; Order 74-26, § 296-155-405, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-407 Protective clothing.** (1) General requirements. Employees exposed to the hazards created by welding, cutting, or brazing operations shall be protected by personal protective equipment in accordance with the requirements of chapter 296-800 WAC, chapter 296-24 WAC, Part I and WAC 296-800-160. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

(2) Specified protective clothing. Protective means which may be employed are as follows:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, or other suitable material may also be desirable as protection against radiated heat and sparks.

(c) Woolen clothing preferable to cotton because it is not so readily ignited and helps protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside.

Note: For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(e) In production work a sheet metal screen in front of the worker's legs can provide further protection against sparks and molten metal in cutting operations.

(f) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(g) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors shall be used.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-155-407, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-407, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-407, filed 1/21/86.]

**WAC 296-155-410 Fire prevention.** (1) When practical, objects to be welded, cut, or heated shall be moved to a designated safe location or, if the objects to be welded, cut, or heated cannot be readily moved, all movable fire hazards in

the vicinity shall be taken to a safe place, or otherwise protected.

(2) If the object to be welded, cut, or heated cannot be moved and if all the fire hazards cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.

(3) No welding, cutting, or heating shall be done where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.

(4) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

(5) When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used.

(6) When welding, cutting, or heating is performed on walls, floors, and ceilings, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent area, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

(7) For the elimination of possible fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the enclosed space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch period. Overnight and at the change of shifts, the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas-consuming device.

(8) Except when the contents are being removed or transferred, drums, pails, and other containers, which contain or have contained flammable liquids, shall be kept closed. Empty containers shall be removed to a safe area apart from hot work operations or open flames.

(9) Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested. For welding, cutting and heating on steel pipelines containing natural gas, the pertinent portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines, shall apply. (49 CFR Part 192, Subpart C.)

(10) Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

**WAC 296-155-415 Ventilation and protection in welding, cutting, and heating.** (1) Mechanical ventilation. For purposes of this section, mechanical ventilation shall meet the following requirements:

(a) Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

(b) General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits, as defined in Part B of this chapter.

(c) Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits as defined in Part B of this chapter.

(d) Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

(e) All air replacing that withdrawn shall be clean and respirable.

(f) Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust from clothing, or for cleaning the work area.

(2) Welding, cutting, and heating in confined spaces.

(a) Except as provided in subdivision (b) of this subsection and subdivision (b) of subsection (3) of this section, either general mechanical or local exhaust ventilation meeting the requirements of subsection (1) of this section shall be provided whenever welding, cutting, or heating is performed in a confined space.

(b) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators in accordance with the requirements of Part C of this chapter, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

(3) Welding, cutting, or heating of metals of toxic significance.

(a) Welding, cutting, or heating in any enclosed spaces involving the metals specified in this subsection shall be performed with either general mechanical or local exhaust ventilation meeting the requirements of subsection (1) of this section:

(i) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.

(ii) Lead base metals;

(iii) Cadmium-bearing filler materials;

(iv) Chromium-bearing metals or metals coated with chromium-bearing materials.

(b) Welding, cutting, or heating in any enclosed spaces involving the metals specified in this subdivision shall be performed with local exhaust ventilation in accordance with the requirements of subsection (1) of this section, or employees shall be protected by air line respirators in accordance with the requirements of Part C of this chapter.

(i) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials;

(ii) Cadmium-bearing or cadmium-coated base metals;

[Order 74-26, § 296-155-410, filed 5/7/74, effective 6/6/74.]

(iii) Metals coated with mercury-bearing metals;

(iv) Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

(c) Employees performing such operations in the open air shall be protected by filter-type respirators in accordance with the requirements of Part C of this chapter, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line respirators in accordance with the requirements of Part C of this chapter.

(d) Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

(4) Inert-gas metal-arc welding.

(a) Since the inert-gas metal-arc welding process involves the production of ultra-violet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultra-violet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed to the process until the following special precautions have been taken:

(i) The use of chlorinated solvents shall be kept at least 200 feet, unless shielded, from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.

(ii) Employees in the area not protected from the arc by screening shall be protected by filter lenses meeting the requirements of Part C of this chapter. When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type, meeting the requirements of Part C of this chapter shall be worn under welding helmets. Hand shields to protect the welder against flashes and radiant energy shall be used when either the helmet is lifted or the shield is removed.

(iii) Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultra-violet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.

(iv) When inert-gas metal-arc welding is being performed on stainless steel, the requirements of subdivision (b) of subsection (3) of this section shall be met to protect against dangerous concentrations of nitrogen dioxide.

(5) General welding, cutting, and heating.

(a) Welding, cutting, and heating, not involving conditions or materials described in subsections (2), (3), or (4) of this section, may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

(b) Employees performing any type of welding, cutting, or heating shall be protected by suitable eye protective equipment in accordance with the requirements of Part C of this chapter.

[Order 74-26, § 296-155-415, filed 5/7/74, effective 6/6/74.]

[Title 296 WAC—p. 2110]

**WAC 296-155-420 Welding, cutting, and heating in way of preservative coatings.** (1) Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable, they shall be stripped from the area to be heated to prevent ignition.

(3) Protection against toxic preservative coatings:

(a) In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application, or the employees shall be protected by air line respirators, meeting the requirements of Part C of this chapter.

(b) In the open air, employees shall be protected by a respirator, in accordance with requirements of Part C of this chapter.

(4) The preservative coatings shall be removed a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heating area may be used to limit the size of the area required to be cleaned.

[Order 74-26, § 296-155-420, filed 5/7/74, effective 6/6/74.]

## PART I ELECTRICAL

**WAC 296-155-426 Introduction.** This part addresses electrical safety requirements that are necessary for the practical safeguarding of employees involved in construction work and is divided into four major divisions and applicable definitions as follows:

(1) Introduction and definitions. Definitions applicable to this part are contained in WAC 296-155-462.

(2) Installation safety requirements. Installation safety requirements are contained in WAC 296-155-441 through 296-155-459. Included in this category are electric equipment and installations used to provide electric power and light on jobsites.

(3) Safety-related work practices. Safety-related work practices are contained in WAC 296-155-428 and 296-155-429. In addition to covering the hazards arising from the use of electricity at jobsites, these regulations also cover the hazards arising from the accidental contact, direct or indirect, by employees with all energized lines, above or below ground, passing through or near the jobsite.

(4) Safety-related maintenance and environmental considerations. Safety-related maintenance and environmental considerations are contained in WAC 296-155-432 and 296-155-434.

(5) Safety requirements for special equipment. Safety requirements for special equipment are contained in WAC 296-155-437.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-426, filed 5/11/88.]

(2007 Ed.)

**WAC 296-155-428 General requirements.** (1) Protection of employees.

(a) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

(b) No person, firm, corporation, or agent of same, shall require or permit any employee to perform any function in proximity to electrical conductors or to engage in any excavation, construction, demolition, repair, or other operation, unless and until danger from accidental contact with said electrical conductors has been effectively guarded by de-energizing the circuit and grounding it or by guarding it by effective insulation or other effective means.

(c) In work areas where the exact location of underground electric powerlines is unknown, no activity which may bring employees into contact with those powerlines shall begin until the powerlines have been positively and unmistakably de-energized and grounded.

(d) Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

(e) No work shall be performed, no material shall be piled, stored or otherwise handled, no scaffolding, commercial signs, or structures shall be erected or dismantled, nor any tools, machinery or equipment operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected, to prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near energized conductors only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the equipment or load shall be ten feet.

(ii) For lines rated over 50 kV. minimum, clearance between the lines and any part of the equipment or load shall be ten feet plus 0.4 inch or each 1 kV. over 50 kV., or twice the length of the line insulator but never less than ten feet.

(f) Work on energized equipment. Only qualified persons shall work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-155-429(4). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(g) Overhead electric lines. Where overhead electric conductors are encountered in proximity to a work area, the employer shall be responsible for:

(i) Ascertaining the voltage and minimum clearance distance required; and

(ii) Maintaining the minimum clearance distance; and

(iii) Ensuring that the requirements of this section are complied with.

(h) If relocation of the electrical conductors is necessary, arrangements shall be made with the owners of the lines for such relocation.

(i) Barriers.

(i) Barriers shall be of such character and construction as to effectively provide the necessary protection without creating other hazards or jeopardizing the operation of the electrical circuits.

(ii) Barriers installed within the ten feet clearance from conductors shall be installed only under the supervision of authorized and qualified persons and this shall include a representative of the electrical utility or owner involved.

(j) Exceptions.

(i) These rules do not apply to the construction, reconstruction, operation, and maintenance, of overhead electrical lines, structures, and associated equipment by authorized and qualified electrical workers.

(ii) These rules do not apply to authorized and qualified employees engaged in the construction, reconstruction, operation, and maintenance, of overhead electrical circuits or conductors and associated equipment of rail transportation systems or electrical generating, transmission, distribution and communication systems which are covered by chapters 296-45 and 296-32 WAC.

(k) Special precautions must be taken.

(i) When handling any winch lines, guy wires, or other free cable, wire or rope in the vicinity of any electrical conductors.

(ii) When pulling a winch line, or other cable or rope under energized electrical conductors from a boom, mast, pile driver, etc., in such a manner as to make possible an approach to within ten feet of a conductor.

(iii) When there is possibility of a winch line, cable, etc., either becoming disconnected or breaking under load because of excessive strain and flipping up into overhead conductors.

(iv) When placing steel, concrete reinforcement, wire mesh, etc.

(v) When handling pipe or rod sections in connection with digging wells or test holes.

(vi) When moving construction equipment, apparatus, machinery, etc., all such movements must avoid striking supporting structures, guy wires, or other elements of the electrical utility system causing the conductors to so swing or move as to decrease clearances to less than ten feet from construction equipment, or to cause them to come together.

(l) Warning sign required.

(i) An approved durable warning sign legible at twelve feet, reading "It is unlawful to operate this equipment within ten feet of electrical conductors" shall be posted and maintained in plain view of the operator at the controls of each crane, derrick, shovel, drilling rig, pile driver or similar apparatus which is capable of vertical, lateral or swinging motion.

(ii) A similar sign shall be installed on the outside of the equipment and located as to be readily visible to mechanics or other persons engaged in the work operation.

(iii) Signs shall be not less than 6" x 8" dimensions with the word "WARNING" or "DANGER" in large letters and painted red across the top and the other letters in black painted on yellow background.

(m) Any overhead wire shall be considered to be an energized line until the owner of such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(2) Passageways and open spaces.

(a) Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

(b) Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a tripping hazard to employees.

(3) Load ratings. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

(4) Fuses. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

(5) Cords and cables.

(a) Worn or frayed electric cords or cables shall not be used.

(b) Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

(6) Interlocks. Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while they are working on the equipment. The interlock systems shall be returned to its operable condition when this work is completed.

(7) Portable electric equipment—Handling. Portable equipment shall be handled in a manner which will not cause damage. Flexible electric cords connected to equipment shall not be used for raising or lowering the equipment. Flexible cords shall not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

(8) Visual inspection. When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts shall first be checked to ensure they are of proper mating configurations.

(9) Connecting attachment plugs.

(a) Employees' hands shall not be wet when plugging and unplugging flexible cords and cord- and plug-connected equipment, if energized equipment is involved.

(b) Energized plug and receptacle connections shall be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water).

(c) Locking-type connectors shall be properly secured after connection.

(10) Routine opening and closing circuits. Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or closing of circuits under load conditions. Cable connectors not of the load-break type, fuses, terminal

lugs, and cable splice connections shall not be used for such purposes, except in an emergency.

(11) Reclosing circuits after protective device operation. After a circuit is deenergized by a circuit protective device, the circuit shall not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. This repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault connection, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

(12) Test instruments and equipment—Use. Only qualified persons shall perform testing work on electric circuits or equipment.

(13) Visual inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until necessary repairs and tests to render the equipment safe have been made.

(14) Rating of equipment. Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

(15) Occasional use of flammable or ignitable materials. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: Flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

(16) Work on energized equipment. Only qualified persons shall work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-155-429(4). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(17) Overhead lines. If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

(18) Unqualified persons. When an unqualified person is working in an elevated position, or on the ground, near overhead lines, the location shall be such that the person and the longest conductive object they may contact cannot come closer to any unguarded, energized overhead line than the following distances:

(a) For voltages to ground 50kV or below—10 ft.;

(b) For voltages to ground over 50kV—10 ft. plus 0.4 inch for every 1kV over 50kV.

(19) Qualified persons. When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person shall not approach or take any conductive object without an approved insulating handle closer to exposed energized parts that are shown in subsection (1)(e) of this section unless:

(a) The person is insulated from the energized part (gloves, with sleeves if necessary), rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed; or

(b) The energized part is insulated both from all other conductive objects at a different potential and from the person; or

(c) The person is insulated from all conductive objects at a potential different from that of the energized part.

(20) Vehicular and mechanical equipment.

(a) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over the voltage. However, under any of the following conditions, the clearance may be reduced:

(i) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over that voltage.

(ii) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(b) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in (a) through (d) of this subsection.

(c) Employees standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:

(i) The employee is using protective equipment rated for the voltage; or

(ii) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

(d) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

(2007 Ed.)

(21) Illumination.

(a) Employees shall not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

(b) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform tasks near exposed energized parts. Employees shall not reach blindly into areas which may contain energized parts.

(22) Confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

(23) Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee handle long dimensional conductive objects (such as ducts and pipes) practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

(24) Portable ladders. Portable ladders shall have non-conductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(25) Conductive apparel. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) shall not be worn if they might contact exposed energized parts.

(26) Housekeeping duties.

(a) Where live parts present an electrical contact hazard, employees shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

(b) Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-428, filed 7/20/94, effective 9/20/94; 92-23-017 (Order 92-13), § 296-155-428, filed 11/10/92, effective 12/18/92; 88-11-021 (Order 88-04), § 296-155-428, filed 5/11/88.]

### **WAC 296-155-429 Lockout and tagging of circuits.**

(1) Controls. Controls that are deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged and padlocked in the open position.

(2) Equipment and circuits. Equipment or circuits that are deenergized shall be rendered inoperative and have tags and locked padlocks attached at all points where such equipment or circuits can be energized.

(3) Tags. Tags shall be placed to identify plainly the equipment or circuits being worked on.

(4) Lockout and tagging. While any employee is exposed to contact with parts of fixed electric equipment or circuits

[Title 296 WAC—p. 2113]

which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both according to the requirements of this section. The requirements shall be followed in the order in which they are presented (i.e., (a) of this subsection first, then (b) of this subsection).

Note 1: As used in this section, fixed equipment refers to equipment fastened in connected by permanent wiring methods.

Note 2: Lockout and tagging procedures that comply with chapter 296-803 WAC will also be deemed to comply with this subsection provided that:

1. The procedures address the electrical safety hazards covered by this part; and
2. The procedures also incorporate the requirements of (c)(iv) and (d)(ii) of this subsection.

(a) Procedures. The employer shall maintain a written copy of the procedures outlined in this subsection and shall make it available for inspection by employees and by the director and his/her authorized representative.

Note: The written procedures may be in the form of a copy of this section, WAC 296-155-429.

(b) Deenergizing equipment.

(i) Safe procedures for deenergizing circuits and equipment shall be determined before circuits or equipment are deenergized.

(ii) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment shall not be used as a substitute for lockout and tagging procedures.

(iii) Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(iv) Stored nonelectrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

(c) Application of locks and tags.

(i) A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in (c)(iii) and (v) of this subsection. The lock shall be attached to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

(ii) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(iii) If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(iv) A tag used without a lock, as permitted by item (iii) of this subsection, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating cir-

cuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(v) A lock may be placed without a tag only under the following conditions:

(A) Only one circuit or piece of equipment is deenergized; and

(B) The lockout period does not extend beyond the work shifts; and

(C) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

(d) Verification of deenergized condition. The requirements of this subsection shall be met before any circuits or equipment can be considered and worked as deenergized.

(i) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(ii) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized conditions exist as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

(e) Reenergizing equipment. These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(i) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

(ii) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

(iii) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the work place, then the lock or tag may be removed by a qualified person designated to perform this task provided that:

(A) The employer ensures that the employee who applied the lock or tag is not available at the work place; and

(B) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that work place.

(iv) There shall be a visual determination that all employees are clear of the circuits and equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-155-429, filed 7/20/04, effective 11/1/04. Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-155-429, filed 8/20/96, effective 10/15/96; 94-15-096 (Order 94-07), § 296-155-429, filed 7/20/94, effective 9/20/94; 88-11-021 (Order 88-04), § 296-155-429, filed 5/11/88.]

**WAC 296-155-432 Maintenance of equipment.** The employer shall ensure that all wiring components and utilization equipment in hazardous locations are maintained in a

dust-tight, dust-ignition-proof, or explosion-proof condition, as appropriate. There shall be no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-432, filed 5/11/88.]

**WAC 296-155-434 Environmental deterioration of equipment.** (1) Deteriorating agents.

(a) Unless identified for use in the operating environment, no conductors or equipment shall be located:

- (i) In damp or wet locations;
- (ii) Where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment; or
- (iii) Where exposed to excessive temperatures.

(b) Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

(2) Protection against corrosion. Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-434, filed 5/11/88.]

**WAC 296-155-437 Batteries and battery charging.**

(1) General requirements.

(a) Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.

(b) Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.

(c) Racks and trays shall be substantial and shall be treated to make them resistant to the electrolyte.

(d) Floors shall be of acid resistant construction unless protected from acid accumulations.

(e) Face shields, aprons, and rubber gloves shall be provided for and worn by workers handling acids or batteries.

(f) Facilities for quick drenching of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.

(g) Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.

(2) Charging.

(a) Battery charging installations shall be located in areas designated for that purpose.

(b) Charging apparatus shall be protected from damage by trucks.

(c) When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-437, filed 5/11/88.]

(2007 Ed.)

**WAC 296-155-441 Applicability.** (1) Covered. WAC 296-155-441 through 296-155-459 contain installation safety requirements for electrical equipment and installations used to provide electric power and light at the jobsite. These sections apply to installations, both temporary and permanent, used on the jobsite; but these sections do not apply to existing permanent installations that were in place before the construction activity commenced.

Note: If the electrical installation is made in accordance with the National Electrical Code ANSI/NFPA 70-1984, exclusive of formal interpretations and tentative interim amendments, it will be deemed to be in compliance with WAC 296-155-444 through 296-155-459, except for WAC 296-155-447 (2)(a) and 296-155-449 (1)(b)(ii)(E), (F), (G), and (J).

(2) Not covered. WAC 296-155-441 through 296-155-459 do not cover installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations. (However, these regulations do cover portable and vehicle-mounted generators used to provide power for equipment used at the jobsite.) See the National Electrical Safety Code (NEC).

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050. 02-12-098, § 296-155-441, filed 6/5/02, effective 8/1/02. Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-441, filed 5/11/88.]

**WAC 296-155-444 General requirements.** (1)

Approval. All electrical conductors and equipment shall be approved.

(2) Examination, installation, and use of equipment.

(a) Examination. The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this part. Suitability of equipment for an identified purpose may be evidenced by listing, labeling, or certification for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(b) Installation and use. Listed, labeled, or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling, or certification.

(3) Interrupting rating. Equipment intended to break current shall have an interrupting rating at system voltage sufficient for the current that must be interrupted.

(4) Mounting and cooling of equipment.

(a) Mounting. Electric equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into holes in masonry, concrete, plaster, or similar materials shall not be used.

(b) Cooling. Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air. Electrical equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.

(5) Splices. Conductors shall be spliced or joined with splicing devices designed for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device designed for the purpose.

(6) Arcing parts. Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(7) Marking. Electrical equipment shall not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(8) Identification of disconnecting means and circuits. Each disconnecting means required by this part for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

(9) Construction site. Precautions shall be taken to make any necessary open wiring inaccessible to unauthorized personnel.

(10) 600 volts, nominal, or less. This subsection applies to equipment operating at 600 volts, nominal, or less.

(a) Working space about electric equipment. Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(i) Working clearances. Except as required or permitted elsewhere in this part, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive shall not be less than indicated in Table I-1. In addition to the dimensions shown in Table I-1, workspace shall not be less than 30 inches (762 mm) wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tile are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control cen-

ters where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

Table I-1  
Working Clearances

Nominal Voltage to Ground	Minimum Clear Distance for Conditions <sup>1</sup>		
	(a) Feet <sup>2</sup>	(b) Feet <sup>2</sup>	(c) Feet <sup>2</sup>
0-150 . . . . .	3	3	3
151-600 . . . . .	3	3 1/2	4

<sup>1</sup> Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace not guarded provided in condition (a) with the operator between.

<sup>2</sup> Note: For International System of Units (SI): One foot=0.3048m.

(ii) Clear spaces. Working space required by this part shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.

(iii) Access and entrance to working space. At least one entrance shall be provided to give access to the working space about electric equipment.

(iv) Front working space. Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet (914 mm).

(v) Headroom. The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches (1.91 m).

(b) Guarding of live parts.

(i) Except as required or permitted elsewhere in this part, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

(A) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(B) By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

(C) By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

(D) By elevation of 8 feet (2.44 m) or more above the floor or other working surface and so installed as to exclude unqualified persons.

(ii) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

(iii) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

(11) Over 600 volts, nominal.

(a) General. Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applica-

ble provisions of subsections (1) through (7) of this section and with the following provisions which supplement or modify those requirements. The provisions of (b), (c), and (d) of this subsection do not apply to equipment on the supply side of the service conductors.

(b) Enclosure for electrical installations. Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet (2.44 m) in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot (2.44 m) fence. The entrances to all buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

(i) Installations accessible to qualified persons only. Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of (c) of this subsection.

(ii) Installations accessible to unqualified persons. Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(c) Workspace about equipment. Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches (1.98 m) high (measured vertically from the floor or platform,) or less than 3 feet (914 mm) wide (measured parallel to the equipment.) The depth shall be as required in Table I-2. The workspace shall be adequate to permit at least a ninety degree opening of doors or hinged panels.

(i) Working space. The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in Table I-2 unless otherwise specified in this part. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of 30 inches (762 mm) horizontally shall be provided.

(2007 Ed.)

Table I-2  
Minimum Depth of Clear Working Space in Front of electric Equipment

Nominal Voltage to Ground	Minimum Clear Distance for Conditions <sup>1</sup>		
	(a) Feet <sup>2</sup>	(b) Feet <sup>2</sup>	(c) Feet <sup>2</sup>
601 to 2,500 .....	3	4	5
2,501 to 9,000 .....	4	5	6
9,001 to 25,000 .....	5	6	9
25,001 to 75kV .....	6	8	10
Above 75kV .....	8	10	12

<sup>1</sup> Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or the tile are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace (not guarded as provided in Condition (a)) with the operator between.

<sup>2</sup> Note: For S1 units: One foot = 0.3048m.

(ii) Lighting outlets and points of control. The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(iii) Elevation of unguarded live parts. Unguarded live parts above working space shall be maintained at elevations not less than specified in Table I-3.

Table I-3  
Elevation of Unguarded Energized Parts Above Working Space

Nominal Voltage to Between Phases	Minimum Elevation
601 to 7,500 .....	8 feet 6 inches <sup>1</sup>
7,501 to 35,000 .....	9 feet
Over 35kV .....	9 feet + 0.37 inches per kV above 35kV

<sup>1</sup> Note: For S1 units: One inch = 25.4mm, one foot = 0.3048m.

(d) Entrance and access to workspace. At least one entrance not less than 24 inches (610 mm) wide and 6 feet 6 inches (1.98 m) high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches (1.22 m) in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be guarded.

(12) Welding and cutting equipment. Welding and cutting equipment shall meet the requirements specified in Parts D and H of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-444, filed 9/22/93, effective 11/1/93; 92-23-017 (Order 92-13), § 296-155-444, filed 11/10/92, effective 12/18/92; 88-11-021 (Order 88-04), § 296-155-444, filed 5/11/88.]

**WAC 296-155-447 Wiring design and protection. (1)** Use and identification of grounded and grounding conductors.

(a) Identification of conductors. A conductor used as a grounded conductor shall be identifiable and distinguishable

from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

(b) Polarity of connections. No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.

(c) Use of grounding terminals and devices. A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.

(2) Branch circuits.

(a) Ground-fault protection.

(i) General. The employer shall use either ground-fault circuit interrupters as specified in (a)(ii) of this subsection or an assured equipment grounding conductor program as specified in (a)(iii) of this subsection to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

(ii) Ground-fault circuit interrupters. All 120-volt, single-phase, 15-ampere and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

(iii) Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:

(A) A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying by the director and any affected employee.

(B) The employer shall designate one or more competent persons (as defined in WAC 296-155-012(4)) to implement the program, and to perform continuing tests and inspections as required.

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

(D) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord-connected and plug-connected equipment required to be grounded:

(I) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(II) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding

conductor. The equipment grounding conductor shall be connected to its proper terminal.

(III) Each outlet receptacle, or power source shall be tested to ensure proper polarity.

(E) All required tests shall be performed:

(I) Before first use;

(II) Before equipment is returned to service following any repairs;

(III) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and

(IV) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

(F) The employer shall not make available or permit the use by employees of any equipment which has not met the requirements of (a)(iii) of this subsection.

(G) Tests performed as required in this subsection shall be recorded. This test record shall identify each receptacle, cord set, and cord-connected and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the director and any affected employee.

(b) Outlet devices. Outlet devices shall have an ampere rating not less than the load to be served and shall comply with the following:

(i) Single receptacles. A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit.

(ii) Two or more receptacles. Where connected to a branch circuit supplying two or more receptacles or outlets, receptacle ratings shall conform to the values listed in Table I-4.

(iii) Receptacles used for the connection of motors. The rating of an attachment plug or receptacle used for cord-connection and plug-connection of a motor to a branch circuit shall not exceed 15 amperes at 125 volts or 10 amperes at 250 volts if individual overload protection is omitted.

Table I-4  
Receptacle Ratings for Various Size Circuits

Circuit Rating Amperes	Receptacle Rating Amperes
15	Not Over 15
20	15 or 20
30	30
40	40 or 50
50	50

(3) Outside conductors and lamps.

(a) 600 volts, nominal, or less. (a)(i) through (iv)(D) of this subsection apply to branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors.

(i) Conductors on poles. Conductors supported on poles shall provide a horizontal climbing space not less than the following:

(A) Power conductors below communication conductors: 30 inches (762 mm).

(B) Power conductors alone or above communication conductors: 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(C) Communication conductors below power conductors: With power conductors 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(ii) Clearance from ground. Open conductors shall conform to the following minimum clearances:

(A) 10 feet (3.05 m)—above finished grade, sidewalks, or from any platform or projection from which they might be reached.

(B) 12 feet (3.66 m)—over areas subject to vehicular traffic other than truck traffic.

(C) 15 feet (4.57 m)—over areas other than those specified in (a)(ii)(D) of this subsection that are subject to truck traffic.

(D) 18 feet (5.49 m)—over public streets, alleys, roads, and driveways.

(iii) Clearance from building openings. Conductors shall have a clearance of at least 3 feet (914 mm) from windows, doors, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet (914 mm) away.

(iv) Clearance over roofs. Conductors above roof space accessible to employees on foot shall have a clearance from the highest point of the roof surface of not less than 8 feet (2.44 m) vertical clearance for insulated conductors, not less than 10 feet (3.05 m) vertical or diagonal clearance for covered conductors, and not less than 15 feet (4.57 m) for bare conductors, except that:

(A) Where the roof space is also accessible to vehicular traffic, the vertical clearance shall not be less than 18 feet (5.49 m); or

(B) Where the roof space is not normally accessible to employees on foot, fully insulated conductors shall have a vertical or diagonal clearance of not less than 3 feet (914 mm); or

(C) Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches (102 mm) in 12 inches (305 mm), the clearance from roofs shall be at least 3 feet (914 mm); or

(D) Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet (1.22 m) of the overhang portion of the roof and they are terminated at a through-the-roof raceway or support, the clearance from roofs shall be at least 18 inches (457 mm).

(b) Location of outdoor lamps. Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

(4) Services.

(a) Disconnecting means.

(i) General. Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(ii) Simultaneous opening of poles. Each service disconnecting means shall simultaneously disconnect all ungrounded conductors.

(b) Services over 600 volts, nominal. The following additional requirements apply to services over 600 volts, nominal.

(i) Guarding. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.

(ii) Warning signs. Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.

(5) Overcurrent protection.

(a) 600 volts, nominal, or less. The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

(i) Protection of conductors and equipment. Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.

(ii) Grounded conductors. Except for motor-running overload protection, overcurrent devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

(iii) Disconnection of fuses and thermal cutouts. Except for devices provided for current-limiting on the supply side of the service disconnecting means, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(iv) Location in or on premises. Overcurrent devices shall be readily accessible. Overcurrent devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitable material.

(v) Arcing or suddenly moving parts. Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.

(vi) Circuit breakers.

(A) Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.

(B) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.

(C) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be marked "SWD."

(b) Over 600 volts, nominal. Feeders and branch circuits over 600 volts, nominal, shall have short-circuit protection.

(6) Effective grounding. The path from circuits, equipment, structures, and conduit or enclosures to ground shall be permanent and continuous; have ample carrying capacity to conduct safely the currents liable to be imposed on it; and have the impedance sufficiently low to limit the potential above ground and to result in the operation of the overcurrent devices in the circuit. (a) through (k) of this subsection contain grounding requirements for systems, circuits, and equipment.

(a) Systems to be grounded. The following systems which supply premises wiring shall be grounded:

(i) Three-wire DC systems. All three-wire DC systems shall have their neutral conductor grounded.

(ii) Two-wire DC systems. Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless they are rectifier-derived from an AC system complying with (a)(iii), (iv), and (v) of this subsection.

(iii) AC circuits, less than 50 volts. AC circuits of less than 50 volts shall be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(iv) AC systems, 50 volts to 1000 volts. AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions, unless exempted by (a)(v) of this subsection:

(A) If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;

(B) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(C) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(D) If a service conductor is uninsulated.

(v) Exceptions. AC systems of 50 volts to 1000 volts are not required to be grounded if the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:

(A) The system is used exclusively for control circuits;

(B) The conditions of maintenance and supervision assure that only qualified persons will service the installation;

(C) Continuity of control power is required; and

(D) Ground detectors are installed on the control system.

(b) Separately derived systems. Where (a) of this subsection requires grounding of wiring systems whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system, (e) of this subsection shall also apply.

(c) Portable and vehicle-mounted generators.

(i) Portable generators. Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:

(A) The generator supplies only equipment mounted on the generator and/or cord-connected and plug-connected equipment through receptacles mounted on the generator; and

(B) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

(ii) Vehicle-mounted generators. Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

(A) The frame of the generator is bonded to the vehicle frame; and

(B) The generator supplies only equipment located on the vehicle and/or cord-connected and plug-connected equipment through receptacles mounted on the vehicle or on the generator; and

(C) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame; and

(D) The system complies with all other provisions of this section.

(iii) Neutral conductor bonding. A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.

(d) Conductors to be grounded. For AC premises wiring systems the identified conductor shall be grounded.

(e) Grounding connections.

(i) Grounded system. For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(ii) Ungrounded systems. For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(f) Grounding path. The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

(g) Supports, enclosures, and equipment to be grounded.

(i) Supports and enclosures for conductors. Metal cable trays, metal raceways, and metal enclosures for conductors shall be grounded, except that:

(A) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; and

(B) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

(I) Runs are less than 25 feet (7.62 m);

(II) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(III) Enclosures are guarded against employee contact.

(ii) Service equipment enclosures. Metal enclosures for service equipment shall be grounded.

(iii) Fixed equipment. Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

(A) If within 8 feet (2.44 m) vertically or 5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.

(B) If located in a wet or damp location and subject to employee contact.

(C) If in electrical contact with metal.

(D) If in a hazardous (classified) location.

(E) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.

(F) If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:

(I) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(II) Metal frames of electrically heated appliances which are permanently and effectively insulated from ground; and

(III) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.

(iv) Equipment connected by cord and plug. Under any of the conditions described in (g)(iv)(A) through (C) of this subsection, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment which may become energized shall be grounded:

(A) If in a hazardous (classified) location (see WAC 296-155-444).

(B) If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.

(C) If the equipment is one of the types listed in (g)(iv)(C)(I) through (V) of this subsection. However, even though the equipment may be one of these types, it need not be grounded if it is exempted by (g)(iv)(C)(VI) of this subsection.

(I) Hand held motor-operated tools;

(II) Cord-connected and plug-connected equipment used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;

(III) Portable and mobile X-ray and associated equipment;

(IV) Tools likely to be used in wet and/or conductive locations; and

(V) Portable hand lamps.

(VI) Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

(v) Nonelectrical equipment. The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over 1kV between conductors.

(h) Methods of grounding equipment.

(i) With circuit conductors. Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this part, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(ii) Grounding conductor. A conductor used for grounding fixed or movable equipment shall have capacity to conduct safely any fault current which may be imposed on it.

(iii) Equipment considered effectively grounded. Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in (h)(i) of this subsection. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

(i) Bonding.

(i) If bonding conductors are used to assure electrical continuity, they shall have the capacity to conduct any fault current which may be imposed.

(ii) When attaching bonding and grounding clamps or clips, a secure and positive metal-to-metal contact shall be made. Such attachments shall be made before closures are opened and material movements are started and shall not be broken until after material movements are stopped and closures are made.

(j) Made electrodes. If made electrodes are used, they shall be free from nonconductive coatings, such as paint or enamel; and, if practicable, they shall be embedded below permanent moisture level. A single electrode consisting of a rod, pipe or plate which has a resistance to ground greater than 25 ohms shall be augmented by one additional electrode installed no closer than 6 feet (1.83 m) to the first electrode.

(k) Grounding of systems and circuits of 1000 volts and over (high voltage).

(i) General. If high voltage systems are grounded, they shall comply with all applicable provisions of (a) through (j) of this subsection as supplemented and modified by (k) of this subsection.

(ii) Grounding of systems supplying portable or mobile equipment. Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

(A) Portable and mobile high voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.

(B) Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(C) Ground-fault detection and relaying shall be provided to automatically deenergize any high voltage system component which has developed a ground fault. The continuity of the equipment grounding conductor shall be continuously monitored so as to de-energize automatically the high

voltage feeder to the portable equipment upon loss of continuity of the equipment grounding conductor.

(D) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet (6.1 m) from any other system or equipment grounding electrode, and there shall be no direct connection between the grounding electrodes, such as buried pipe, fence or like objects.

(iii) Grounding of equipment. All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet (2.44 m) above ground or grade level need not be grounded.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-447, filed 9/22/93, effective 11/1/93; 88-11-021 (Order 88-04), § 296-155-447, filed 5/11/88.]

**WAC 296-155-449 Wiring methods, components, and equipment for general use.** (1) Wiring methods. The provisions of this subsection do not apply to conductors which form an integral part of equipment such as motors, controllers, motor control centers and like equipment.

(a) General requirements.

(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

(ii) Wiring in ducts. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type shall be installed in any duct used for vapor removal or in any shaft containing only such ducts.

(iii) Receptacles for attachment plugs shall be approved, concealed contact type with a contact for extending ground continuity and shall be so designed and constructed that the plug may be pulled out without leaving any live parts exposed to accidental contact. All temporary outlet boxes shall be of a type suitable for use in wet or damp locations.

(iv) Attachment plugs or other connectors supplying equipment at more than 300 volts shall be of the skirted type or otherwise so designed that arcs will be confined.

(b) Temporary wiring.

(i) Scope. The provisions of (b) of this subsection apply to temporary electrical power and lighting wiring methods which may be of a class less than would be required for a permanent installation. Except as specifically modified in (b) of this subsection, all other requirements of this part for permanent wiring shall apply to temporary wiring installations. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed.

(ii) General requirements for temporary wiring.

(A) Feeders shall originate in a distribution center. The conductors shall be run as multiconductor cord or cable assemblies or within raceways; or, where not subject to phys-

ical damage, they may be run as open conductors on insulators not more than 10 feet (3.05 m) apart.

(B) Branch circuits shall originate in a power outlet or panelboard. Conductors shall be run as multiconductor cord or cable assemblies or open conductors, or shall be run in raceways. All conductors shall be protected by overcurrent devices at their ampacity. Runs of open conductors shall be located where the conductors will not be subject to physical damage, and the conductors shall be fastened at intervals not exceeding 10 feet (3.05 m). No branch-circuit conductors shall be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if the branch circuit is run as open conductors.

(C) Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor, and all receptacles shall be electrically connected to the grounding conductor. Receptacles for uses other than temporary lighting shall not be installed on branch circuits which supply temporary lighting. Receptacles shall not be connected to the same ungrounded conductor of multiwire circuits which supply temporary lighting.

(D) Disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(E) All lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

(F) Temporary lights shall be equipped with hard usage (S or SJ types) electric cords with connections and insulation maintained in safe condition. "Brewery" cord (type CBO or NB) may be substituted for hard usage cord provided it is protected from physical damages. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices shall retain the insulation, outer sheath properties, flexibility, and usage characteristics of the cord being spliced.

When pin-type connectors or lampholders are utilized, the area of perforations caused by lampholder removal shall be restored to the insulation capabilities of the cord.

(G) Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

(H) A box shall be used wherever a change is made to a raceway system or a cable system which is metal clad or metal sheathed.

(I) Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage.

(J) Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage.

Note: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard

usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

(iii) Guarding. For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

(2) Cabinets, boxes, and fittings.

(a) Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

(b) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers. If metal covers are used, they shall be grounded. In energized installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

(c) Pull and junction boxes for systems over 600 volts, nominal. In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 600 volts, nominal:

(i) Complete enclosure. Boxes shall provide a complete enclosure for the contained conductors or cables.

(ii) Covers. Boxes shall be closed by covers securely fastened in place. Underground box covers that weigh over 100 pounds (43.6 kg) meet this requirement. Covers for boxes shall be permanently marked "HIGH VOLTAGE." The marking shall be on the outside of the box cover and shall be readily visible and legible.

(3) Knife switches. Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical, a locking device shall be provided to ensure that the blades remain in the open position when so set.

(4) Switchboards and panelboards. Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures designed for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

(5) Enclosures for damp or wet locations.

(a) Cabinets, fittings, and boxes. Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.

(b) Switches and circuit breakers. Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

(6) Conductors for general wiring. All conductors used for general wiring shall be insulated unless otherwise permitted in this part. The conductor insulation shall be of a type that is suitable for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

(7) Flexible cords and cables.

(a) Use of flexible cords and cables.

(i) Permitted uses. Flexible cords and cables shall be suitable for conditions of use and location. Flexible cords and cables shall be used only for:

(A) Pendants;

(B) Wiring of fixtures;

(C) Connection of portable lamps or appliances;

(D) Elevator cables;

(E) Wiring of cranes and hoists;

(F) Connection of stationary equipment to facilitate their frequent interchange;

(G) Prevention of the transmission of noise or vibration;

or

(H) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair.

(ii) Attachment plugs for cords. If used as permitted in (a)(i)(C), (F), or (H) of this subsection, the flexible cord shall be equipped with an attachment plug and shall be energized from a receptacle outlet.

(iii) Prohibited uses. Unless necessary for a use permitted in (a)(i) of this subsection, flexible cords and cables shall not be used:

(A) As a substitute for the fixed wiring of a structure;

(B) Where run through holes in walls, ceilings, or floors;

(C) Where run through doorways, windows, or similar openings, except as permitted in subsection (1)(b)(ii)(I) of this section;

(D) Where attached to building surfaces; or

(E) Where concealed behind building walls, ceilings, or floors.

(b) Identification, splices, and terminations.

(i) Identification. A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor shall be distinguishable from other conductors.

(ii) Marking. Type SJ, SJO, SJT, SJTO, S, SO, ST, and STO cords shall not be used unless durably marked on the surface with the type designation, size, and number of conductors.

(iii) Splices. Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(iv) Strain relief. Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

(v) Cords passing through holes. Flexible cords and cables shall be protected by bushings or fittings where passing through holes in covers, outlet boxes, or similar enclosures.

(vi) Trailing cables shall be protected from damage.

(vii) Cord and cable passing through work areas shall be covered or elevated to protect it from damage which would create a hazard to employees.

(8) Portable cables over 600 volts, nominal. Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables shall not be operated with splices unless the splices are of the permanent molded, vulcanized, or other equivalent type. Termination enclosures shall be marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

(9) Fixture wires.

(a) General. Fixture wires shall be suitable for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.

(b) Uses permitted. Fixture wires may be used:

(i) For installation in lighting, fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(ii) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(c) Uses not permitted. Fixture wires shall not be used as branch-circuit conductors except as permitted for Class 1 power-limited circuits.

(10) Equipment for general use.

(a) Lighting fixtures, lampholders, lamps, and receptacles.

(i) Live parts. Fixtures, lampholders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet (2.44 m) above the floor may have exposed parts.

(ii) Support. Fixtures, lampholders, rosettes, and receptacles shall be securely supported. A fixture that weighs more than 6 pounds (2.72 kg) or exceeds 16 inches (406 mm) in any dimension shall not be supported by the screw shell of a lampholder.

(iii) Portable lamps. Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identified and attached to the screw shell and the identified blade of the attachment plug. In addition, portable handlamps shall comply with the following:

(A) Metal shell, paperlined lampholders shall not be used;

(B) Handlamps shall be equipped with a handle of molded composition or other insulating material;

(C) Handlamps shall be equipped with a substantial guard attached to the lampholder or handle;

(D) Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord.

(iv) Lampholders. Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weather-proof type.

(v) Fixtures. Fixtures installed in wet or damp locations shall be identified for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

(b) Receptacles, cord connectors, and attachment plugs (caps).

(i) Configuration. Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating. Receptacles connected to circuits having different voltages, frequencies, or types of current (AC or DC) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

(ii) Damp and wet locations. A receptacle installed in a wet or damp location shall be designed for the location.

(c) Appliances.

(i) Live parts. Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, shall have no live parts normally exposed to employee contact.

(ii) Disconnecting means. A means shall be provided to disconnect each appliance.

(iii) Rating. Each appliance shall be marked with its rating in volts and amperes or volts and watts.

(d) Motors. This subdivision applies to motors, motor circuits, and controllers.

(i) In sight from. If specified that one piece of equipment shall be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet (15.2 m) from the other.

(ii) Disconnecting means.

(A) A disconnecting means shall be located in sight from the controller location. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(B) The disconnecting means shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.

(C) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(I) The controller disconnecting means shall be capable of being locked in the open position.

(II) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(D) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

(E) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(F) An individual disconnecting means shall be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:

(I) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist;

(II) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(III) If a group of motors is in a single room in sight from the location of the disconnecting means.

(iii) Motor overload, short-circuit, and ground-fault protection. Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions do not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(iv) Protection of live parts—all voltages.

(A) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:

(I) By installation in a room or enclosure that is accessible only to qualified persons;

(II) By installation on a balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons; or

(III) By elevation 8 feet (2.44 m) or more above the floor.

(B) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, insulating mats or platforms shall be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

(e) Transformers.

(i) Application. The following subsections cover the installation of all transformers, except:

(A) Current transformers;

(B) Dry-type transformers installed as a component part of other apparatus;

(C) Transformers which are an integral part of an X-ray, high frequency, or electrostatic-coating apparatus;

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(D) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits.

(ii) Operating voltage. The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.

(iii) Transformers over 35 kV. Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35 kV shall be in a vault.

(iv) Oil-insulated transformers. If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.

(v) Fire protection. Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

(vi) Transformer vaults. Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.

(vii) Pipes and ducts. Any pipe or duct system foreign to the vault installation shall not enter or pass through a transformer vault.

(viii) Material storage. Materials shall not be stored in transformer vaults.

(f) Capacitors.

(i) Drainage of stored charge. All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge and maintaining the discharged state after the capacitor is disconnected from its source of supply.

(ii) Over 600 volts. Capacitors rated over 600 volts, nominal, shall comply with the following additional requirements:

(A) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.

(B) For series capacitors the proper switching shall be assured by use of at least one of the following:

(I) Mechanically sequenced isolating and bypass switches;

(II) Interlocks; or

(III) Switching procedure prominently displayed at the switching location.

[Statutory Authority: Chapter 49.17 RCW, 93-19-142 (Order 93-04), § 296-155-449, filed 9/22/93, effective 11/1/93; 92-23-017 (Order 92-13), § 296-155-449, filed 11/10/92, effective 12/18/92; 88-11-021 (Order 88-04), § 296-155-449, filed 5/11/88.]

**WAC 296-155-452 Specific purpose equipment and installations.** (1) Cranes and hoists. This subsection applies to the installation of electric equipment and wiring used in connection with cranes, monorail hoists, hoists, and all runways.

(a) Disconnecting means.

(i) Runway conductor disconnecting means. A readily accessible disconnecting means shall be provided between the runway contact conductors and the power supply.

(ii) Disconnecting means for cranes and monorail hoists. A disconnecting means, capable of being locked in the open position, shall be provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(A) If this additional disconnecting means is not readily accessible from the crane or monorail hoist operating station, means shall be provided at the operating station to open the power circuit to all motors of the crane or monorail hoist.

(B) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(I) The unit is floor controlled;

(II) The unit is within view of the power supply disconnecting means; and

(III) No fixed work platform has been provided for servicing the unit.

(b) Control. A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(c) Clearance. The dimension of the working space in the direction of access to live parts which may require examination, adjustment, servicing, or maintenance while alive shall be a minimum of 2 feet 6 inches (762 mm). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable, or the installation shall provide equivalent access.

(d) Grounding. All exposed metal parts of cranes, monorail hoists, hoists and accessories including pendant controls shall be metallically joined together into a continuous electrical conductor so that the entire crane or hoist will be grounded in accordance with WAC 296-155-447(6). Moving parts, other than removable accessories or attachments, having metal-to-metal bearing surfaces shall be considered to be electrically connected to each other through the bearing surfaces for grounding purposes. The trolley frame and bridge frame shall be considered as electrically grounded through the bridge and trolley wheels and its respective tracks unless conditions such as paint or other insulating materials prevent reliable metal-to-metal contact. In this case a separate bonding conductor shall be provided.

(2) Elevators, escalators, and moving walks.

(a) Disconnecting means. Elevators, escalators, and moving walks shall have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(b) Control panels. If control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or panels capable of being locked closed.

(3) Electric welders—disconnecting means.

(a) Motor-generator, AC transformer, and DC rectifier arc welders. A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.

(b) Resistance welders. A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The

ampere rating of this disconnecting means shall not be less than the supply conductor ampacity.

(4) X-ray equipment.

(a) Disconnecting means.

(i) General. A disconnecting means shall be provided in the supply circuit. The disconnecting means shall be operable from a location readily accessible from the X-ray control. For equipment connected to a 120-volt branch circuit of 30 amperes or less, a grounding-type attachment plug cap and receptacle of proper rating may serve as a disconnecting means.

(ii) More than one piece of equipment. If more than one piece of equipment is operated from the same high-voltage circuit, each piece or each group of equipment as a unit shall be provided with a high-voltage switch or equivalent disconnecting means. This disconnecting means shall be constructed, enclosed, or located so as to avoid contact by employees with its live parts.

(b) Control-radiographic and fluoroscopic types. Radiographic and fluoroscopic-type equipment shall be effectively enclosed or shall have interlocks that deenergize the equipment automatically to prevent ready access to live current-carrying parts.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-05-027, § 296-155-452, filed 2/7/06, effective 4/1/06. Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-452, filed 5/11/88.]

#### **WAC 296-155-456 Hazardous (classified) locations.**

(1) Scope. This section sets forth requirements for electric equipment and wiring in locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section or area shall be considered individually in determining its classification. These hazardous (classified) locations are assigned six designations as follows: Class I, Division 1; Class I, Division 2; Class II, Division 1; Class II, Division 2; Class III, Division 1; Class III, Division 2. For definitions of these locations see WAC 296-155-428. All applicable requirements in this part apply to all hazardous (classified) locations, unless modified by provisions of this section.

(a) All components and utilization equipment used in a hazardous location shall be chosen from among those listed by a nationally recognized testing laboratory, such as Underwriters' Laboratories, Inc., or Factory Mutual Engineering Corp., except custom-made components and utilization equipment.

(b) Equipment approved for a specific hazardous location shall not be installed or intermixed with equipment approved for another specific hazardous location.

(2) Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be approved as intrinsically safe or approved for the hazardous (classified) location or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(a) Intrinsically safe. Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (classified) location included in its listing or labeling.

(b) Approved for the hazardous (classified) location.

(i) General. Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by "groups" characterized by their ignitable or combustible properties.

(ii) Marking. Equipment shall not be used unless it is marked to show the class, group, and operating temperature or temperature range, based on operation in a 40°C ambient, for which it is approved. The temperature marking shall not exceed the ignition temperature of the specific gas, vapor, or dust to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the nonheat-producing type (such as junction boxes, conduit, and fitting) and equipment of the heat-producing type having a maximum temperature of not more than 100°C (212°F) need not have a marked operating temperature or temperature range.

(B) Fixed lighting fixtures marked for use only in Class I, Division 2 locations need not be marked to indicate the group.

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(D) Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(c) Safe for the hazardous (classified) location. Equipment which is safe for the location shall be of a type and design which the employer demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: Wiring methods, wiring connections, conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this subsection.

(3) Conduits. All conduits shall be threaded and shall be made wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper shall be utilized.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-456, filed 5/11/88.]

**WAC 296-155-459 Special systems.** (1) Systems over 600 volts, nominal. (a) through (d) of this subsection contain

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general requirements for all circuits and equipment operated at over 600 volts.

(a) Wiring methods for fixed installations.

(i) Above ground. Above-ground conductors shall be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable designed for the use and purpose. However, open runs of nonmetallic-sheathed cable or of bare conductors or busbars may be installed in locations which are accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, shall be grounded. Open runs of insulated wires and cables having a bare lead sheath or a braided outer covering shall be supported in a manner designed to prevent physical damage to the braid or sheath.

(ii) Installations emerging from the ground. Conductors emerging from the ground shall be enclosed in raceways. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, PVC schedule 80 or equivalent extending from the ground line up to a point 8 feet (2.44 m) above finished grade. Conductors entering a building shall be protected by an enclosure from the ground line to the point of entrance. Metallic enclosures shall be grounded.

(b) Interrupting and isolating devices.

(i) Circuit breakers. Circuit breakers located indoors shall consist of metal-enclosed or fire-resistant, cell-mounted units. In locations accessible only to qualified personnel, open mounting of circuit breakers is permitted. A means of indicating the open and closed position of circuit breakers shall be provided.

(ii) Fused cutouts. Fused cutouts installed in buildings or transformer vaults shall be of a type identified for the purpose. They shall be readily accessible for fuse replacement.

(iii) Equipment isolating means. A means shall be provided to completely isolate equipment for inspection and repairs. Isolating means which are not designed to interrupt the load current of the circuit shall be either interlocked with a circuit interrupter or provided with a sign warning against opening them under load.

(c) Mobile and portable equipment.

(i) Power cable connections to mobile machines. A metallic enclosure shall be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure shall include provisions for a solid connection for the ground wire(s) terminal to ground effectively the machine frame. The method of cable termination used shall prevent any strain or pull on the cable from stressing the electrical connections. The enclosure shall have provision for locking so only authorized qualified persons may open it and shall be marked with a sign warning of the presence of energized parts.

(ii) Guarding live parts. All energized switching and control parts shall be enclosed in effectively grounded metal cabinets or enclosures. Circuit breakers and protective equipment shall have the operating means projecting through the metal cabinet or enclosure so these units can be reset without locked doors being opened. Enclosures and metal cabinets shall be locked so that only authorized qualified persons have access and shall be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving-type machines (shovels, draglines, etc.) shall be guarded.

(d) Tunnel installations.

(i) Application. The provisions of this item apply to installation and use of high-voltage power distribution and utilization equipment which is associated with tunnels and which is portable and/or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators.

(ii) Conductors. Conductors in tunnels shall be installed in one or more of the following:

- (A) Metal conduit or other metal raceway;
- (B) Type MC cable; or
- (C) Other suitable multiconductor cable.

Conductors shall also be so located or guarded as to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor shall be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor may be insulated or bare.

(iii) Guarding live parts. Bare terminals of transformers, switches, motor controllers, and other equipment shall be enclosed to prevent accidental contact with energized parts. Enclosures for use in tunnels shall be drip-proof, weather-proof, or submersible as required by the environmental conditions.

(iv) Disconnecting means. A disconnecting means that simultaneously opens all ungrounded conductors shall be installed at each transformer or motor location.

(v) Grounding and bonding. All nonenergized metal parts of electric equipment and metal raceways and cable sheaths shall be grounded and bonded to all metal pipes and rails at the portal and at intervals not exceeding 1000 feet (305 m) throughout the tunnel.

(2) Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits.

(a) Classification. Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified in accordance with their respective voltage and power limitations as summarized in (a)(i) through (iii) of this subsection.

(i) Class 1 circuits.

(A) A Class 1 power-limited circuit is supplied from a source having a rated output of not more than 30 volts and 1000 volt-amperes.

(B) A Class 1 remote control circuit or a Class 1 signaling circuit has a voltage which does not exceed 600 volts; however, the power output of the source need not be limited.

(ii) Class 2 and Class 3 circuits.

(A) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is required) or by a combination of a power source and overcurrent protection.

(B) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(C) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(iii) Application. The maximum circuit voltages in (a)(i) and (ii) of this subsection apply to sinusoidal AC or continu-

ous DC power sources, and where wet contact occurrence is not likely.

(b) Marking. A Class 2 or Class 3 power supply unit shall not be used unless it is durably marked where plainly visible to indicate the class of supply and its electrical rating.

(3) Communications systems.

(a) Scope. These provisions for communication systems apply to such systems as central-station-connected and non-central-station-connected telephone circuits, radio receiving and transmitting equipment, and outside wiring for fire and burglar alarm, and similar central station systems. These installations need not comply with the provisions of WAC 296-155-444 through 296-155-459(2), except WAC 296-155-447 (3)(a)(ii) and 296-155-456.

(b) Protective devices.

(i) Circuits exposed to power conductors. Communication circuits so located as to be exposed to accidental contact with light or power conductors operating at over 300 volts shall have each circuit so exposed provided with an approved protector.

(ii) Antenna lead-ins. Each conductor of a lead-in from an outdoor antenna shall be provided with an antenna discharge unit or other means that will drain static charges from the antenna system.

(c) Conductor location.

(i) Outside of buildings.

(A) Receiving distribution lead-in or aerial-drop cables attached to buildings and lead-in conductors to radio transmitters shall be so installed as to avoid the possibility of accidental contact with electric light or power conductors.

(B) The clearance between lead-in conductors and any lightning protection conductors shall not be less than 6 feet (1.83 m).

(ii) On poles. Where practicable, communication conductors on poles shall be located below the light or power conductors. Communications conductors shall not be attached to a crossarm that carries light or power conductors.

(iii) Inside of buildings. Indoor antennas, lead-ins, and other communication conductors attached as open conductors to the inside of buildings shall be located at least 2 inches (50.8 mm) from conductors of any light or power or Class 1 circuits unless a special and equally protective method of conductor separation is employed.

(d) Equipment location. Outdoor metal structures supporting antennas, as well as self-supporting antennas such as vertical rods or dipole structures, shall be located as far away from overhead conductors of electric light and power circuits of over 150 volts to ground as necessary to avoid the possibility of the antenna or structure falling into or making accidental contact with such circuits.

(e) Grounding.

(i) Lead-in conductors. If exposed to contact with electric light or power conductors, the metal sheath of aerial cables entering buildings shall be grounded or shall be interrupted close to the entrance to the building by an insulating joint or equivalent device. Where protective devices are used, they shall be grounded.

(ii) Antenna structures. Masts and metal structures supporting antennas shall be permanently and effectively grounded without splice or connection in the grounding conductor.

(iii) Equipment enclosures. Transmitters shall be enclosed in a metal frame or grill or separated from the operating space by a barrier, all metallic parts of which are effectively connected to ground. All external metal handles and controls accessible to the operating personnel shall be effectively grounded. Unpowered equipment and enclosures shall be considered grounded where connected to an attached coaxial cable with an effectively grounded metallic shield.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-459, filed 9/22/93, effective 11/1/93; 88-11-021 (Order 88-04), § 296-155-459, filed 5/11/88.]

#### **WAC 296-155-462 Definitions applicable to this part.**

The definitions given in this section apply to the terms used in Part I. The definitions given here for "approved" and "qualified person" apply, instead of the definitions given in WAC 296-155-012, to the use of these terms in Part I.

(1) "Acceptable." An installation or equipment is acceptable to the director, and approved within the meaning of this Part I:

(a) If it is accepted, certified, listed, labeled, or otherwise determined to be safe by a qualified testing laboratory capable of determining the suitability of materials and equipment for installation and use in accordance with this standard; or

(b) With respect to an installation or equipment of a kind which no qualified testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another state agency, or by a federal, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with those provisions; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his/her authorized representatives.

(2) "Accepted." An installation is "accepted" if it has been inspected and found to be safe by a qualified testing laboratory.

(3) "Accessible." (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

(4) "Accessible." (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

(5) "Ampacity." The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

(6) "Appliances." Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions.

(7) "Approved." Approved by the director of the department of labor and industries or his/her authorized representative: Provided, however, That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such

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as Underwriters' Laboratories, the Bureau of Mines, or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) the provisions of WAC 296-155-006 shall apply.

(8) "Askarel." A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

(9) "Attachment plug (plug cap) (cap)." A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(10) "Automatic." Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

(11) "Bare conductor." See "conductor."

(12) "Bonding." The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

(13) "Bonding jumper." A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

(14) "Branch circuits." That portion of a wiring system extending beyond the final overcurrent device protecting the circuit. (A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.)

(15) "Building." A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

(16) "Cabinet." An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

(17) "Certified." Equipment is "certified" if it:

(a) Has been tested and found by a qualified testing laboratory to meet applicable test standards or to be safe for use in a specified manner; and

(b) Is of a kind whose production is periodically inspected by a qualified testing laboratory. Certified equipment must bear a label, tag, or other record of certification.

(18) "Circuit breaker."

(a) (600 volts nominal, or less.) A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

(b) (Over 600 volts, nominal.) A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

(19) "Class I locations." Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

(a) Class I, Division 1. A Class I, Division 1 location is a location:

- (i) In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or
- (ii) In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or
- (iii) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2. A Class I, Division 2 location is a location:

- (i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or
- (ii) In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or
- (iii) That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or of liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

(20) "Class II locations." Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) Class II, Division 1. A Class II, Division 1 location is a location:

- (i) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or
- (ii) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or
- (iii) In which combustible dusts of an electrically conductive nature may be present.

Note: Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2. A Class II, Division 2 location is a location in which:

- (i) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or
- (ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II, Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

(21) "Class III locations." Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

(a) Class III, Division 1. A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, sawdust, woodchips, and other material of similar nature.

(b) Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture. Collector ring. A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(22) "Collector ring." A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(23) "Concealed." Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. See "accessible. (As applied to wiring methods.)"

(24) "Conductor."

(a) Bare. A conductor having no covering or electrical insulation whatsoever.

(b) Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

(25) "Controller." A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(26) "Covered conductor." See "conductor."

(27) "Cutout." (Over 600 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

(28) "Cutout box." An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See "cabinet.")

(29) "Damp location." See "location."

(30) "Dead front." Without live parts exposed to a person on the operating side of the equipment.

(31) "Device." A unit of an electrical system which is intended to carry but not utilize electric energy.

(32) "Disconnecting means." A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

(33) "Disconnecting (or isolating) switch." (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

(34) "Dry location." See "location."

(35) "Enclosed." Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

(36) "Enclosure." The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

(37) "Equipment." A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation.

(38) "Equipment grounding conductor." See "grounding conductor, equipment."

(39) "Explosion-proof apparatus." Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

(40) "Exposed. (As applied to live parts.)" Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

(41) "Exposed. (As applied to wiring methods.)" On or attached to the surface or behind panels designed to allow access. See "accessible. (As applied to wiring methods.)"

(42) "Exposed. (For the purposes of WAC 296-155-459(3), Communications systems.)" Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

(43) "Externally operable." Capable of being operated without exposing the operator to contact with live parts.

(44) "Feeder." All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

(45) "Festoon lighting." A string of outdoor lights suspended between two points more than 15 feet (4.57 m) apart.

(46) "Fitting." An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

(47) "Fuse." (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

(48) "Ground." A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

(49) "Grounded." Connected to earth or to some conducting body that serves in place of the earth.

(50) "Grounded, effectively." (Over 600 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

(51) "Grounded conductor." A system or circuit conductor that is intentionally grounded.

(52) "Grounding conductor." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

(53) "Grounding conductor, equipment." The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

(54) "Grounding electrode conductor." The conductor used to connect the grounding electrode to the equipment

grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

(55) "Ground-fault circuit interrupter." A device for the protection of personnel that functions to deenergize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

(56) "Guarded." Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

(57) "Hazard." That condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

(58) "Hoistway." Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

(59) "Identified (conductors or terminals)." Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be recognized as grounded.

(60) "Identified (for the use)." Recognized as suitable for the specific purpose, function, use, environment, application, etc., where described as a requirement in this standard. Suitability of equipment for a specific purpose, environment, or application is determined by a qualified testing laboratory where such identification includes labeling or listing.

(61) "Insulated conductor." See "conductor."

(62) "Interrupter switch." (Over 600 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

(63) "Intrinsically safe equipment and associated wiring." Equipment and associated wiring in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under certain prescribed test conditions, of causing ignition of a mixture of flammable or combustible material in air in its most easily ignitable concentration.

(64) "Isolated." Not readily accessible to persons unless special means for access are used.

(65) "Isolated power system." A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

(66) "J-Box (junction box)." An electrical sheet metal enclosure with openings for conduit or cable with sheet metal cover. The primary purpose is for joining conductors for splicing.

(67) "Labeled." Equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

(68) "Lighting outlet." An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

(69) "Listed." Equipment or materials included in a list published by a qualified testing laboratory whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

(70) "Location."

(a) Damp location. Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements.

(b) Dry location. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) Wet location. Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as locations exposed to weather and unprotected.

(71) "Mobile X ray." X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

(72) "Motor control center." An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

(73) "Outlet." A point on the wiring system at which current is taken to supply utilization equipment.

(74) "Overcurrent." Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

(75) "Overload." Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See "overcurrent.")

(76) "Panelboard." A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

(77) "Portable X ray." X-ray equipment designed to be hand-carried.

(78) "Power fuse." (Over 600 volts, nominal.) See "fuse."

(79) "Power outlet." An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

(80) "Premises wiring system." That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

(81) "Qualified person." One familiar with the construction and operation of the equipment and the hazards involved.

(82) "Qualified testing laboratory." A properly equipped and staffed testing laboratory which has capabilities for and which provides the following services:

(a) Experimental testing for safety of specified items of equipment and materials referred to in this standard to determine compliance with appropriate test standards or performance in a specified manner;

(b) Inspecting the run of such items of equipment and materials at factories for product evaluation to assure compliance with the test standards;

(c) Service-value determinations through field inspections to monitor the proper use of labels on products and with authority for recall of the label in the event a hazardous product is installed;

(d) Employing a controlled procedure for identifying the listed and/or labeled equipment or materials tested; and

(e) Rendering creditable reports or findings that are objective and without bias of the tests and test methods employed.

(83) "Raceway." A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this part. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid non-metallic conduit, intermediate metal conduit, liquidtight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

(84) "Readily accessible." Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

(85) "Receptacle." A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

(86) "Receptacle outlet." An outlet where one or more receptacles are installed.

(87) "Remote-control circuit." Any electric circuit that controls any other circuit through a relay or an equivalent device.

(88) "Sealable equipment." Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

(89) "Separately derived system." A premises wiring system whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

(90) "Service." The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

(91) "Service conductors." The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

(92) "Service drop." The overhead service conductors from the last pole or other aerial support to and including the

splices, if any, connecting to the service-entrance conductors at the building or other structure.

(93) "Service-entrance conductors, overhead system." The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

(94) "Service-entrance conductors, underground system." The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

(95) "Service equipment." The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

(96) "Service raceway." The raceway that encloses the service-entrance conductors.

(97) "Shock hazard." To exist at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500-ohm load is more than 5 milliamperes.

(98) "Signaling circuit." Any electric circuit that energizes signaling equipment.

(99) "Switchboard." A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panelboard.")

(100) "Switches."

(a) General-use switch. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) General-use snap switch. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this part.

(c) Isolating switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) Motor-circuit switch. A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

(101) "Switching devices." (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cut-outs, disconnecting (or isolating) switches, disconnecting means, and interrupter switches.

(102) "Transformer." A transformer is an apparatus for converting electrical power in an a-c system at one voltage or current into electrical power at some other voltage or current without the use of rotating parts.

(103) "Transportable X ray." X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

(104) "Utilization equipment." Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

(105) "Utilization system." A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

(106) "Ventilated." Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

(107) "Volatile flammable liquid." A flammable liquid having a flash point below 38°C (100°F) or whose temperature is above its flash point, or a Class II combustible liquid having a vapor pressure not exceeding 40 psia (276 kPa) at 38°C (100°F) whose temperature is above its flash point.

(108) "Voltage." (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

(109) "Voltage, nominal." A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

(110) "Voltage to ground." For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

(111) "Watertight." So constructed that moisture will not enter the enclosure.

(112) "Weatherproof." So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

(113) "Wet location." See "location."

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-462, filed 7/20/94, effective 9/20/94; 93-19-142 (Order 93-04), § 296-155-462, filed 9/22/93, effective 11/1/93; 88-11-021 (Order 88-04), § 296-155-462, filed 5/11/88.]

## PART J STAIRWAYS

**Note: Requirements relating to portable ladders and fixed ladders have been moved to chapter 296-876 WAC, Ladders, portable and fixed.**

**WAC 296-155-475 Scope and application.** This part applies to all stairways used in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under chapter 296-155 WAC, and also sets forth, in specified circumstances, when stairways are required to be provided.

**Reference:**

- Requirements for ladders used on or with scaffolds are located in chapter 296-874 WAC, Scaffolds.
- Requirements for portable ladders and fixed ladders are located in chapter 296-876 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-155-475, filed 7/24/06, effective 12/1/06; 05-20-068, § 296-155-475, filed 10/4/05, effective 1/1/06. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-475, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-475, filed 1/21/86; Order 76-6, § 296-155-475, filed 3/1/76; Order 74-26, § 296-155-475, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-47501 Definitions applicable to this part.** (1) Equivalent means alternative designs, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for employees than the method or item specified in the standard.

(2) Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the structural members lose their ability to carry the loads.

(3) Handrail means a rail used to provide employees with a handhold for support.

(4) Lower levels means those areas to which an employee can fall from a stairway or ladder. Such areas include ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, material, water, equipment, and similar surfaces. It does not include the surface from which the employee falls.

(5) Nosing means that portion of a tread projecting beyond the face of the riser immediately below.

(6) Platform means a walking/working surface for persons, elevated above the surrounding floor or ground.

(7) Point of access means all areas used by employees for work-related passage from one area or level to another. Such open areas include doorways, passageways, stairway openings, studded walls, and various other permanent or temporary openings used for such travel.

(8) Riser height means the vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of a platform/landing to the top of the next higher tread or platform/landing.

(9) Spiral stairway means a series of steps attached to a vertical pole and progressing upward in a winding fashion within a cylindrical space.

(10) Stairrail system means a vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stairrail system may also be a "handrail."

(11) Tread depth means the horizontal distance from front to back of a tread (excluding nosing, if any).

(12) Unprotected sides and edges means any side or edge (except at entrances to points of access) of a stairway where there is no stairrail system or wall 36 inches (.9 m) or more in height, and any side or edge (except at entrances to points of access) of a stairway landing, or ladder platform where there is no wall or guardrail system 39 inches (1 m) or more in height.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-155-47501, filed 7/24/06, effective 12/1/06; 05-20-068, § 296-155-47501, filed 10/4/05, effective 1/1/06. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-47501, filed 11/22/91, effective 12/24/91.]

**WAC 296-155-476 General requirements.** (1) A stairway or ladder shall be provided at all personnel points of access where there is a break in elevation of 19 inches (48

cm) or more, and no ramp, runway, sloped embankment, or personnel hoist is provided.

(a) Employees shall not use any spiral stairways that will not be a permanent part of the structure on which construction work is being performed.

(b) A double-cleated ladder or two or more separate ladders shall be provided when ladders are the only means of access or exit from a working area for 25 or more employees, or when a ladder is to serve simultaneous two-way traffic.

(c) When a building or structure has only one point of access between levels, that point of access shall be kept clear to permit free passage of employees. When work must be performed or equipment must be used such that free passage at that point of access is restricted, a second point of access shall be provided and used.

(d) When a building or structure has two or more points of access between levels, at least one point of access shall be kept clear to permit free passage of employees.

(2) Employers shall provide and install all stairway and ladder fall protection systems required by this part and shall comply with all other pertinent requirements of this part before employees begin the work that necessitates the installation and use of stairways, ladders, and their respective fall protection systems.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-05-027, § 296-155-476, filed 2/7/06, effective 4/1/06. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-476, filed 11/22/91, effective 12/24/91.]

**WAC 296-155-477 Stairways.** (1) General. The following requirements apply to all stairways as indicated:

(a) Stairways that will not be a permanent part of the structure on which construction work is being performed shall have landings of not less than 30 inches (76 cm) in the direction of travel and extend at least 22 inches (56 cm) in width at every 12 feet (3.7 m) or less of vertical rise.

(b) Stairs shall be installed between 30 deg. and 50 deg. from horizontal.

(c) In all buildings or structures two or more stories or twenty-four feet or more in height or depth, suitable permanent or temporary stairways shall be installed.

(d) Stairways, ramps or ladders shall be provided at all points where a break in elevation of eighteen inches or more occurs in a frequently traveled passageway, entry or exit.

(e) A minimum of one stairway shall be provided for access and exit for buildings and structures to three stories or thirty-six feet; if more than three stories or thirty-six feet, two or more stairways shall be provided. Where two stairways are provided and work is being performed in the stairways, one shall be maintained clear for access between levels at all times.

(f) Wood frame buildings.

(i) The stairway to a second or higher floor shall be completed before studs are raised to support the next higher floor.

(ii) Roof and attic work areas of all buildings shall be provided with a safe means of access and egress, such as stairways, ramps or ladders.

(iii) Cleats shall not be nailed to studs to provide access to and egress from roof or other work areas.

(g) Steel frame buildings. Stairways shall extend to the uppermost floor that has been planked or decked. Ladders may be used above that point.

(h) Reinforced concrete or composite steel—Concrete buildings. Stairways shall extend to the lowermost floor upon which a complete vertical shoring system is in place. A minimum of two ladders at different locations for each floor may be used above this floor but not to exceed three floors.

(i) Riser height and tread depth shall be uniform within each flight of stairs, including any foundation structure used as one or more treads of the stairs. Variations in riser height or tread depth shall not be over 1/4-inch (0.6 cm) in any stairway system.

(j) Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width of the platform to less than 20 inches (51 cm).

(k) Metal pan landings and metal pan treads, when used, shall be secured in place before filling with concrete or other material.

(l) All parts of stairways shall be free of hazardous projections, such as protruding nails.

(m) Slippery conditions on stairways shall be eliminated before the stairways are used to reach other levels.

(n) Employers are permitted to use alternating tread type stairs as long as they install, use, and maintain the stairs in accordance with manufacturer's recommendations and the following:

(i) The stair must be installed at an angle of seventy degrees or less.

(ii) The stair must be capable of withstanding a minimum uniform load of one hundred pounds per square foot with a design factor of 1.7, and the treads must be capable of carrying a minimum concentrated load of three hundred pounds at the center of any treadspan or exterior arc with a design factor of 1.7. If the stair is intended for greater loading, construction must allow for that loading.

(iii) The stair must be equipped with a handrail on each side to assist the user in climbing or descending.

(o) Due to space limitations, when a permanent stairway must be installed at an angle above fifty degrees, such an installation (commonly called an inclined or ship's ladder) shall have treads, open risers and handrails on both sides.

(p) Where ladders are permitted for access under subsection (1) of this section, means shall be provided for employee hoisting of tools and material, such as a well wheel and hoisting line or the equivalent, so employees will have both hands free for ascending and descending ladders.

(2) Temporary service. The following requirements apply to all stairways as indicated:

(a) Except during stairway construction, foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled in with concrete or other material at a later date, unless the stairs are temporarily fitted with wood or other solid material at least to the top edge of each pan. Such temporary treads and landings shall be replaced when worn below the level of the top edge of the pan.

(b) Except during stairway construction, foot traffic is prohibited on skeleton metal stairs where permanent treads and/or landings are to be installed at a later date, unless the

stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.

(c) Treads for temporary service shall be made of wood or other solid material, and shall be installed the full width and depth of the stair.

(3) Stairrails and handrails. The following requirements apply to all stairways as indicated:

(a) Stairways having four or more risers or rising more than 30 inches (76 cm), whichever is less, shall be equipped with:

- (i) At least one handrail; and
- (ii) One stairrail system along each unprotected side or edge.

Note: When the top edge of a stairrail system also serves as a handrail, subdivision (g) of this subsection applies.

(b) Winding and spiral stairways shall be equipped with a handrail offset sufficiently to prevent walking on those portions of the stairways where the tread width is less than 6 inches (15 cm).

(c) The height of stairrails shall be as follows:

(i) Stairrails installed after the effective date of this standard, shall be not less than 36 inches (91.5 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(ii) Stairrails installed before the effective date of this standard, shall be not less than 30 inches (76 cm) nor more than 34 inches (86 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(d) Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, shall be provided between the top rail of the stairrail system and the stairway steps.

(i) Midrails, when used, shall be located at a height midway between the top edge of the stairrail system and the stairway steps.

(ii) Screens or mesh, when used, shall extend from the top rail to the stairway step, and along the entire opening between top rail supports.

(iii) When intermediate vertical members, such as balusters, are used between posts, they shall be not more than 19 inches (48 cm) apart.

(iv) Other structural members, when used, shall be installed such that there are no openings in the stairrail system that are more than 19 inches (48 cm) wide.

(e) Handrails and the top rails of stairrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 n) applied within 2 inches (5 cm) of the top edge, in any downward or outward direction, at any point along the top edge.

(f) The height of handrails shall be not more than 37 inches (94 cm) nor less than 30 inches (76 cm) from the upper surface of the handrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(g) When the top edge of a stairrail system also serves as a handrail, the height of the top edge shall be not more than 37 inches (94 cm) nor less than 36 inches (91.5 cm) from the upper surface of the stairrail system to the surface of the

tread, in line with the face of the riser at the forward edge of the tread.

(h) Stairrail systems and handrails shall be so surfaced as to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.

(i) Handrails shall provide an adequate handhold for employees grasping them to avoid falling.

(j) The ends of stairrail systems and handrails shall be constructed so as not to constitute a projection hazard.

(k) Handrails that will not be a permanent part of the structure being built shall have a minimum clearance of 3 inches (8 cm) between the handrail and walls, stairrail systems, and other objects.

(l) Unprotected sides and edges of stairway landings shall be provided with guardrail systems. Guardrail system criteria are contained in chapter 296-155 WAC, Part K.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-477, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-477, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-477, filed 11/22/91, effective 12/24/91.]

#### PART J-1 SCAFFOLDS

**Note: Requirements relating to scaffolds have been moved to chapter 296-869 WAC.**

#### PART K FLOOR OPENINGS, WALL OPENINGS AND STAIRWAYS

**WAC 296-155-500 Definitions applicable to this part.**

**Floor hole** means an opening measuring less than 12 inches but more than 1 inch in its least dimension in any floor, roof, or platform through which materials but not persons may fall, such as a belt hole, pipe opening, or slot opening.

**Floor opening** means an opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which persons may fall.

**Handrail** means a rail used to provide employees with a handhold for support.

**Low pitched roof** means a roof having a slope less than or equal to four in twelve.

**Mechanical equipment** means all motor or human propelled wheeled equipment except for wheelbarrows, mop-carts, robotic thermoplastic welders and robotic crimpers.

**Nose, nosing** means that portion of a tread projecting beyond the face of the riser immediately below.

**Platform** means a walking/working surface for persons, elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

**Riser height** means the vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of a platform/landing to the top of the next higher tread or platform/landing.

**Roof** means the exterior surface on the top of a building. This does not include floors which, because a building has not been completely built, temporarily become the top surface of a building.

**Roofing work** means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

**Runway** means a passageway for persons, elevated above the surrounding floor or ground level, such as a foot-walk along shafting or a walkway between buildings.

**Safety monitoring system** means a safety system in which a competent person monitors the safety of all employees in a roofing crew, and warns them when it appears to the monitor that they are unaware of the hazard or are acting in an unsafe manner. The competent person must be on the same roof and within visual distance of the employees, and must be close enough to verbally communicate with the employees.

**Stair platform** means an extended step or landing breaking a continuous run of stairs.

**Stairrail system** means a vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stairrail system may also be a "handrail."

**Stairs, stairways** means a series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment that are used more or less continuously or routinely by employees or only occasionally by specific individuals. For the purpose of this part, a series of steps and landings having three or more rises constitutes stairs or stairway.

**Standard railing** means a vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

**Standard strength and construction** means any construction of railings, covers, or other guards that meets the requirements of this part.

**Toeboard** means a vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.

**Tread depth** means the horizontal distance from front to back of tread (excluding nosing, if any).

**Unprotected side or edge** means any side or edge of a roof perimeter where there is no wall three feet (.9 meters) or more in height.

**Wall opening** means an opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall, such as an opening for a window, a yard arm doorway or chute opening.

**Work area** means that portion of a roof where roofing work is being performed.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-500, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-500, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-500, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-500, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-500, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-500, filed 6/17/81; Order 74-26, § 296-155-500, filed 5/7/74, effective 6/6/74.]

#### **WAC 296-155-505 Guardrails, handrails and covers.**

(1) General provisions. This part applies to temporary or emergency conditions where there is danger of employees or

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materials falling through floor, roof, or wall openings, or from stairways, runways, ramps, open sided floors, open sides of structures, bridges, or other open sided walking or working surfaces.

(2) The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.

(3) When guardrails or covers required by this section must be temporarily removed to perform a specific task, the area shall be constantly attended by a monitor to warn others of the hazard or shall be protected by a movable barrier.

(4) Guarding of floor openings and floor holes.

(a) Floor openings shall be guarded by a standard railing and toe boards or cover, as specified in subsections (4)(g) and (7) of this section. In general, the railing shall be provided on all exposed sides, except at entrances to stairways. All vehicle service pits shall have a cover or removable type standard guardrail. When not in use, pits shall be covered or guarded. Where vehicle service pits are to be used again immediately, and the service person is within a 50 foot distance of the unguarded pit and also within line of sight of the unguarded pit, the cover or guardrail need not be replaced between uses. Where vehicle service pits are used frequently, the perimeters of the pits shall be delineated by high visibility, luminescent, skid resistant paint. Such painted delineation shall be kept clean and free of extraneous materials.

(b) Ladderway floor openings or platforms shall be guarded by standard railings with standard toe boards on all exposed sides, except at entrance to opening, with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.

(c) Hatchways and chute floor openings shall be guarded by one of the following:

(i) Hinged covers of standard strength and construction and a standard railing with only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings;

(ii) A removable standard railing with toe board on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railing shall be kept in place when the opening is not in use and shall be hinged or otherwise mounted so as to be conveniently replaceable.

(d) Wherever there is danger of falling through a skylight opening, and the skylight itself is not capable of sustaining the weight of a two hundred pound person with a safety factor of four, standard guardrails shall be provided on all exposed sides or the skylight shall be covered in accordance with (g) of this subsection.

(e) Pits and trap door floor openings shall be guarded by floor opening covers of standard strength and construction. While the cover is not in place, the pit or trap openings shall be protected on all exposed sides by removable standard railings.

(f) Manhole floor openings shall be guarded by standard covers which need not be hinged in place. While the cover is

not in place, the manhole opening shall be protected by standard railings.

(g) All floor opening or hole covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(i) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

(ii) All covers shall be color coded or they shall be marked with the word "hole" or "cover" to provide warning of the hazard.

(iii) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(h) Floor holes, into which persons can accidentally walk, shall be guarded by either a standard railing with standard toe board on all exposed sides, or a floor hole cover of standard strength and construction that is secured against accidental displacement. While the cover is not in place, the floor hole shall be protected by a standard railing.

(5) Guarding of wall openings.

(a) Wall openings, from which there is a drop of more than 4 feet, and the bottom of the opening is less than 3 feet above the working surface, shall be guarded as follows:

(i) When the height and placement of the opening in relation to the working surface is such that either a standard rail or intermediate rail will effectively reduce the danger of falling, one or both shall be provided;

(ii) The bottom of a wall opening, which is less than 4 inches above the working surface, regardless of width, shall be protected by a standard toe board or an enclosing screen either of solid construction or as specified in subsection (7)(f)(ii) of this section.

(b) An extension platform, outside a wall opening, onto which materials can be hoisted for handling shall have standard guardrails on all exposed sides or equivalent. One side of an extension platform may have removable railings in order to facilitate handling materials.

(c) When a chute is attached to an opening, the provisions of (a) of this subsection shall apply, except that a toe board is not required.

(6) Guarding of open sided surfaces.

(a) Every open sided floor, platform or surface four feet or more above adjacent floor or ground level shall be guarded by a standard railing, or the equivalent, as specified in subsection (7)(a) of this section, on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a standard toe board wherever, beneath the open sides, persons can pass, or there is moving machinery, or there is equipment with which falling materials could create a hazard.

(b) Runways shall be guarded by a standard railing, or the equivalent, as specified in subsection (7) of this section, on all open sides, 4 feet or more above the floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.

(c) Runways used exclusively for special purposes may have the railing on one side omitted where operating condi-

tions necessitate such omission, providing the falling hazard is minimized by using a runway not less than 18 inches wide.

(d) Where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding shall be provided.

(e) Regardless of height, open sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, and similar hazards, shall be guarded with a standard railing and toe board.

(f) Open sides of gardens, patios, recreation areas and similar areas located on roofs of buildings or structures shall be guarded by permanent standard railings or the equivalent. Where a planting area has been constructed adjacent to the open sides of the roof and the planting area is raised above the normal walking surface of the roof area, the open side of the planting area shall also be protected with standard railings or the equivalent.

(7) Standard specifications.

(a) A standard railing shall consist of top rail, intermediate rail, toe board, and posts, and shall have a vertical height of 42 inches (1.1 m) plus or minus 3 inches (8 cm) (39-45 inches) from upper surface of top rail to floor, platform, runway, or ramp level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this subsection. The intermediate rail shall be halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

Note: When employees are using stilts, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the height of the stilts.

(b) Minimum requirements for standard railings under various types of construction are specified in the following items:

(i) For wood railings, the posts shall be of at least 2 inch by 4 inch stock spaced not to exceed 8 feet; the top rail shall be of at least 2 inch by 4 inch stock and each length of lumber shall be smooth surfaced throughout the length of the railing. The intermediate rail shall be of at least 1 inch by 6 inch stock.

(ii) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal OD diameter with posts spaced not more than 8 feet on centers.

(iii) For structural steel railings, posts and top and intermediate rails shall be of 2 inch by 2 inch by 3/8 inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than 8 feet on centers.

(iv) For wire rope railings, the top and intermediate railings shall be at least 1/2 inch fibre core rope, or the equivalent to meet strength factor and deflection of (b)(v) of this subsection. Posts shall be spaced not more than 8 feet on centers. The rope shall be stretched taut, so as to present a minimum deflection.

(v) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.

(vi) Railings receiving heavy stresses from employees trucking or handling materials shall be provided additional strength by the use of heavier stock, closer spacing of posts, bracing, or by other means.

(vii) Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following conditions:

(A) A smooth surfaced top rail at a height above floor, platform, runway, or ramp level of between 39 inches and 45 inches;

(B) When the 200-pound (890N) test load specified in subsection (6)(b)(v) of this section is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches (1.0m) above the walking/working level. Guardrail system components selected and constructed in accordance with this part will be deemed to meet this requirement;

(C) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;

(D) Elimination of overhang of rail ends unless such overhang does not constitute a hazard.

(c)(i) A standard toe board shall be 4 inches minimum in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and have not more than 1/4 inch clearance above floor level. It may be made of any substantial material, either solid, or with openings not over 1 inch in greatest dimension.

(ii) Where material is piled to such height that a standard toe board does not provide protection, paneling, or screening from floor to intermediate rail or to top rail shall be provided.

(d) Floor opening covers shall be of any material that meets the following strength requirements:

(i) Conduits, trenches, and manhole covers and their supports, when located in roadways, and vehicular aisles shall be designed to carry a truck rear axle load of at least 2 times the maximum intended load;

(ii) All floor opening covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(A) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

(B) All covers shall be color coded or they shall be marked with the word "hole" or "cover" to provide warning of the hazard.

(C) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(e) Skylight openings that create a falling hazard shall be guarded with a standard railing, or covered in accordance with (d)(ii) of this subsection.

(f) Wall opening protection shall meet the following requirements:

(i) Barriers shall be of such construction and mounting that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.

(ii) Screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied horizontally at any point on the near side of the screen. They may be of solid construction of grill work with openings not more than 8 inches long, or of slat work with openings not more than 4 inches wide with length unrestricted.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-505, filed 7/3/00, effective 10/1/00. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-505, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-505, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-505, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-505, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-505, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-505, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-505, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-505, filed 6/17/81; Order 76-29, § 296-155-505, filed 9/30/76; Order 74-26, § 296-155-505, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-50503 Roofing brackets.** (1) Roofing brackets shall be constructed to fit the pitch of the roof.

(2) Securing: Brackets shall be secured in place by nailing in addition to the pointed metal projections. When it is impractical to nail brackets, rope supports shall be used. When rope supports are used, they shall consist of first grade manila of at least 3/4 inch diameter, or equivalent.

(3) Crawling boards or chicken ladders.

(a) Crawling boards shall be not less than ten inches wide and one inch thick, having cleats 1 x 1 1/2 inches.

(i) The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed twenty-four inches.

(ii) Nails shall be driven through and clinched on the underside.

(iii) The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

(b) A firmly fastened lifeline of at least 3/4 inch diameter rope, or equivalent, shall be strung beside each crawling board for a handhold.

(c) Crawling boards shall be secured to the roof by means of adequate ridge hooks or other effective means.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-50503, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-50503, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-50503, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50503, filed 1/21/86.]

**WAC 296-155-50505 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-50505, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-50505, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50505, filed 1/21/86.]

**WAC 296-155-510 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-510, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-155-510, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-510, filed 1/21/86; Order 74-26, § 296-155-510, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-515 Ramps, runways, and inclined walkways.** (1) Width. Ramps, runways and inclined walkways shall be eighteen inches or more wide.

(2) Standard railings. Ramps, runways and inclined walkways shall be provided with standard railings when located four feet or more above ground or floor level.

(3) Ramp specifications. Ramps, runways and walkways shall not be inclined more than twenty degrees from horizontal and when inclined shall be cleated or otherwise treated to prevent a slipping hazard on the walking surface.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-515, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-515, filed 4/25/95, effective 10/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-515, filed 1/21/86.]

## PART L CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS

**WAC 296-155-525 Cranes and derricks.** (1) Definitions applicable to this part:

**Accessory** - a secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

**Administrative or regulatory authority** - a governmental agency, or the employer in the absence of governmental jurisdiction.

**Angle indicator (boom)** - an accessory which measures the angle of the boom to the horizontal.

**Appointed** - assigned specific responsibilities by the employer or the employer's representative.

**Authorized person** - means a person approved or assigned by the employer to perform a specific type of duty or duties or be at a specific location or locations at the workplace.

**Auxiliary hoist** - a secondary hoist rope system used either in conjunction with, or independently of, the main hoist system.

**Axis of rotation** - the vertical axis around which the crane superstructure rotates.

**Axle** - the shaft or spindle with which or about which a wheel rotates. On wheel-mounted cranes it refers to a type of axle assembly including housings, gearing, differential, bearings, and mounting appurtenances.

**Axle (bogie)** - two or more axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscillation of the wheels.

**Ballast** - weight used to supplement the weight of the machine in providing stability for lifting working loads (the term **ballast** is normally associated with locomotive cranes).

**Base, anchor bolt** - a crane base that is bolted to a footing.

**Base, expendable** - for static-mounting cranes, a style of bottom mast section or member that is cast into a concrete footing block; all or part of this component is lost to future installations.

**Base, fixed** - a crane base that does not travel. It may be expendable, knee braced, or anchor bolted.

**Base (mounting)** - the traveling base on which the rotating superstructure of a locomotive or crawler crane is mounted.

**Base, tower crane** - the lowermost supporting component of the crane.

**Base, travel** - a crane base that is a ballasted platform mounted on trucks that ride along rails.

**Boom (crane)** - a member hinged at the rotating superstructure and used for supporting the existing tackle.

**Boom angle** - the angle above or below horizontal of the longitudinal axis of the base boom section.

**Boom hoist mechanism** - means for supporting the boom and controlling the boom angle.

**Boom point** - the outer extremity of the crane boom, containing the hoist sheave assembly.

**Boom point sheave assembly** - an assembly of sheaves and pin built as an integral part of the boom point.

**Boom stop** - a device used to limit the angle of the boom at the highest recommended position.

**Brake** - a device used for retarding or stopping motion.

**Brace, tower** - a structural attachment placed between a crane tower and an adjacent structure to pass loads to the adjacent structure and permit the crane to be erected to greater than free standing height.

**Buffer** - an energy absorbing device for reducing impact when a moving crane or trolley reaches the end of its permitted travel.

**Cab** - a housing which covers the rotating superstructure machinery, or the operator's or driver's station.

**Climbing frame** - a frame used with climbing cranes to transmit operational and climbing reactions to the host building frame.

**Climbing ladder** - a steel member with crossbars (used in parts) suspended from a climbing frame and used as jacking support points when some cranes climb.

**Clutch** - a means for engagement or disengagement of power.

**Commercial truck vehicle** - a commercial motor vehicle designed primarily for the transportation of property in connection with business and industry.

**Counterweight** - weight used to supplement the weight of the machine in providing stability for lifting working loads.

**Counterweight jib** - a horizontal member of a crane on which the counterweights and usually the hoisting machinery are mounted.

**Crane carrier** - the undercarriage of a wheel-mounted crane specifically designed for transporting the rotating crane superstructure. It may or may not provide its own travel mechanism. It is distinguished from a commercial truck vehicle in that it is not designed to transport personnel, materials, or equipment other than the crane-rotating superstructure.

**Cross-over points** - in multiple layer spooling of rope on a drum, those points of rope contact where the rope crosses the preceding rope layer.

**Designated** - selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

**Drum** - the cylindrical member around which a rope is wound for lifting and lowering the load or boom.

**Dynamic (loading)** - loads introduced into the machine or its components due to accelerating or decelerating forces.

**Flange point** - a point of contact between rope and drum flange where the rope changes layers.

**Free standing height** - that height of a crane which is supported by the tower (mast) alone without assistance from braces, guys, or other means.

**Gage, track** - the horizontal distance between two rails measured perpendicular to the direction of travel.

**Gantry (A-frame)** - a structural frame, extending above the superstructure, to which the boom support ropes are reeved.

**High strength (traction) bolts** - high strength tensile bolts used in the assembly of crane sections. The bolts are installed in tension by torquing or other means at a level greater than that produced by in- or out-of-service loads for the purpose of reducing the likelihood of bolt fatigue failure.

**Hoist mechanism** - a hoist drum and rope reeving system used for lifting and lowering loads.

**Jib** - an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles in the vertical plane of the boom.

**Jib backstop** - a device which will restrain the jib from turning over backward.

**Job site** - work area defined by the construction contract.

**Limiting device** - a mechanical device which is operated by some part of a power driven machine or equipment to control loads or motions of the machine or equipment.

**Load (working)** - the external load in pounds (kilograms) applied to the crane, including the weight of load-attaching equipment such as lower load block, shackles, and slings.

**Load block, lower** - the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.

**Load block, upper** - the assembly of shackle, swivel, sheaves, pins, and frame suspended from the boom point.

**Load ratings** - crane ratings in pounds (kilograms) established by the manufacturer.

**Mast (boom)** - a frame hinged at or near the boom hinge for use in connection with supporting a boom. The head of the mast is usually supported and raised or lowered by the boom hoist ropes.

**Mast (jib)** - a frame hinged at or near the boom point for use in connection with supporting a jib.

**Normal operating conditions.**

**Cab- or station-operated cranes** - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices on the crane, and no other persons except those appointed are to be on the crane.

**Ground- or floor-operated cranes** - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are mounted to the crane but operated with the operator off the crane, and no other persons except those appointed are to be on the crane.

**Remote-operated cranes** - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are mounted to any part of the crane, and no other persons except those appointed are to be on the crane.

**Out-of-service** - the condition of a crane when unloaded, without power and with the controls unattended and prepared to endure winds above the in-service level.

**Outriggers** - extendable or fixed members attached to the mounting base, which rest on supports at the outer ends used to support the crane.

**Pawl (dog)** - a device for positively holding a member against motion in one or more directions.

**Payload** - that load or loads being transported by the commercial truck chassis from place to place.

**Pendant** - a rope or strand of specified length with fixed end connections.

**Pitch diameter** - the diameter of a sheave or rope drum measured at the center line of the rope.

**Power-controlled lowering** - a system or device in the power train, other than the load hoist brake, which can control the lowering rate of speed of the load hoist mechanism.

**Qualified person** - a person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

**Radius (load)** - the horizontal distance from a projection of the axis of rotation to the base of the crane, before loading, to the center of the vertical hoist line or tackle with load applied.

**Rail clamp** - a tong-like metal device mounted on a locomotive crane car, which can be connected to the track.

**Reeving** - a rope system in which the rope travels around drums and sheaves.

**Remote control station** - a location, not on the crane, from which the operator can control all the crane movements.

**Repetitive pickup point** - when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.

**Rope** - refers to wire rope unless otherwise specified.

**Rotation resistant rope** - a wire rope consisting of an inner layer of strand laid in one direction covered by a layer of strand laid in the opposite direction. This has the effect of counteracting torque by reducing the tendency of the finished rope to rotate.

**Running rope** - a rope which travels around sheaves or drums.

**Shall** - this word indicates that the rule is mandatory and must be followed.

**Service, light** - service that involves irregular operation with loads generally about one-half or less of the rated load; a service crane at a storage yard or building site would be an example.

**Service, normal** - service that involves operating occasionally at rated load but normally at less than eighty-five percent of the rated load and not more than ten lift cycles per hour except for isolated instances; a crane used for concrete placement at a building site would be an example.

**Service, heavy** - service that involves operating at eighty-five percent to one hundred percent of the rated load or in excess of ten lift cycles per hour as a regular specified procedure; some cranes operating at material yards or in industrial applications may fall into this category.

**Sheave** - a grooved wheel or pulley used with a rope to change the direction and point of application of a pulling force.

**Should** - this word indicates that the rule is a recommendation, the advisability of which depends on the facts in each situation.

**Side loading** - a load applied to an angle to the vertical plane of the boom.

**Stabilizer** - stabilizers are extendable or fixed members attached to the mounting base to increase the stability of the crane, but which may not have the capability of relieving all of the weight from wheels or tracks.

**Standby crane** - a crane which is not in regular service but which is used occasionally or intermittently as required.

**Standing (guy) rope** - a supporting rope which maintains a constant distance between the points of attachment to the two components connected by the rope.

**Structural competence** - the ability of the machine and its components to withstand the stresses imposed by applied loads.

**Superstructure** - the rotating upper frame structure of the machine and the operating machinery mounted thereon.

**Swing** - rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

**Swing mechanism** - the machinery involved in providing rotation of the superstructure.

**Swivel** - a load carrying member with thrust bearings to permit rotation under load in a plane perpendicular to the direction of the load.

**Swiveling** - the rotation of the load attachment portion (hook or shackle) of a load block (lower) or hook assembly about its axis of suspension in relation to the load line(s).

**Tackle** - an assembly of ropes and sheaves arranged for lifting, lowering, or pulling.

**Telescoping boom** - consists of a base boom from which one or more boom sections are telescoped for additional length.

**Telescoping (tower crane)** - a process whereby the height of a traveling or fixed base crane is increased typically by raising the inner tower and then adding sections at the top of the outer tower; there are also cranes that are telescoped by adding to the inner tower from below.

**Tower (mast)** - a vertical structural frame consisting of columns and bracing capable of supporting an upperstructure with its working and dynamic loads and transmitting them to the supporting surface or structure.

**Traction (high strength) bolts** - see high strength bolts.

**Transit** - the moving or transporting of a crane from one job site to another.

**Travel** - the function of the machine moving under its own power from one location to another on a job site.

**Trolley** - the device that travels along the load jib and contains the upper load block.

**Two-blocking** - the condition in which the lower load block or hook assembly comes in contact with the upper load block or boom point sheave assembly.

**Weathervaning** - wind induced rotation of a crane upperstructure, when out-of-service, to expose minimal surface area to the wind.

**Wedge** - a tapered wood or steel device used to provide stability to cranes during use as a climber. When the wedges are tightened against the four main legs of the tower, they convert overturning moments into horizontal forces to be resisted by the floor framing or slab.

**Wheel base** - the distance between centers of front and rear axles. For a multiple axle assembly the axle center for wheel base measurement is taken as the midpoint of the assembly.

**Whipline (runner or auxiliary)** - a secondary rope system usually of lighter load capacity than that provided by the main rope system.

**Winch head** - a power driven spool for handling of loads by means of friction between fiber or wire rope and the spool.

(2) General requirements.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer's specifications are not available the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

(b) Rated load capacities, and recommended operating speeds, and special hazard warnings, or instruction, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while at the control station.

(c) Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site.

(d) The employer shall designate a competent person who shall inspect all machinery and equipment prior to each use, and periodically during use to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.

(e) A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the department. The employer shall maintain a permanent record of the dates and results of all inspections for each hoisting machine and piece of equipment.

(f) A tag line or guide rope shall be used on all loads that swing freely. Guide ropes or tag lines shall be held by experienced persons.

(g) Care shall be taken to guard against injury to workers, or damage to scaffolds or buildings, from swinging loads.

(h) The operator shall avoid carrying loads over people.

(i) When work is stopped or when the derrick is not in operation, the boom shall be lowered to a horizontal position or tied in place to prevent it whipping with the wind or other external force.

(j) Only authorized personnel shall make sling hitches on loads.

(k) Workers shall not be allowed to ride on loads handled by derricks.

(l) Operators shall observe signals only from duly authorized persons. Under no circumstances shall a load be moved until the signal is received from authorized personnel.

(m) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of chapter 296-806 WAC, Machine safety.

(n) A minimum distance of thirty inches clearance shall be maintained between the swing radius of the greatest extension of the crane superstructure or counterweights and a stationary object, including the crane itself, while the crane is in operation. When this clearance cannot be maintained, suitable barricades or safeguards shall be used to isolate the pinch point hazard area.

(o) All exhaust pipes shall be guarded or insulated where contact by employees, in the performance of normal duties, is possible.

(3) Additional requirements.

(a) Whenever internal combustion engine powered equipment exhausts in enclosed spaces, tests shall be made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. (See chapter 296-62 WAC, the general occupational health standards and chapter 296-841 WAC, identifying and controlling respiratory hazards.)

(b) All cab glazing shall be safety glazing material. Windows shall be provided in the front and on both sides of the cab or operator's compartment with visibility forward and to either side. Visibility forward shall include a vertical range adequate to cover the boom point at all times. The front window may have a section which can be readily removed or held open, if desired. If the section is of the type held in the open position, it shall be secured to prevent inadvertent closure. A windshield wiper should be provided on the front window.

(c)(i) Where necessary for rigging or service requirements, a ladder or steps shall be provided to give access to a cab roof.

(ii) On cranes, guardrails, handholds and steps shall be provided for easy access to the car and cab in accordance with chapter 296-155 WAC, Part C-1 and Part J.

(iii) Platforms and walkways shall have anti-skid surfaces.

(d) Fuel tank filler pipe shall be located in such a position, or protected in such manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.

(i) An accessible fire extinguisher of 5BC rating, or higher, shall be available at all operator stations or cabs of equipment.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

(ii) All fuels shall be transported, stored, and handled to meet the rules of Part D of this chapter. When fuel is transported by vehicles on public highways, department of transportation rules concerning such vehicular transportation are considered applicable.

(e) Except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet;

(ii) For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV. over 50 kV., or twice the length of the line insulator, but never less than 10 feet;

(iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV., and 10 feet for voltages over 50 kV. up to and including 345 kV., and 16 feet for voltages up to and including 750 kV.;

(iv) A person shall be designated to observe clearance of the equipment and give timely warning to insure that the required separation is maintained for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation;

(vi) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded;

(vii) Prior to work near transmitter tower where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be deenergized or tests shall be made to determine if electrical charge is induced on the crane.

(f) The following precautions shall be taken when necessary to dissipate induced voltage:

(i) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

(ii) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

(iii) Combustible and flammable materials shall be removed from the immediate area prior to operations.

(g) No modifications or additions which affect the capacity or safe operation of the equipment shall be made by the employer without the manufacturer's or a qualified engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(h) The employer shall comply with Power Crane and Shovel Association, Mobile Hydraulic Crane Standard No. 2.

(i) Sideboom cranes mounted on wheel or crawler tractors shall meet the requirements of SAE J743a-1964.

(4) Crawler, locomotive, and truck cranes.

(a) All jibs shall have positive stops to prevent their movement of more than 5° above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this standard.

(b) All crawler, truck or locomotive cranes in use shall meet the applicable requirements for design, inspection, construction, testing, maintenance and operation as prescribed in the ANSI B30.5-1989, Safety Code for Crawler, Locomotive and Truck Cranes.

(5) Tower cranes.

(a) Tower cranes shall be erected, jumped and dismantled under the immediate supervision of a competent person, designated by the employer.

(b) Tower cranes shall be erected, maintained and used in accordance with the manufacturer's specifications, recommendations and procedures. All modifications shall be approved by the manufacturer and engineered by a professional engineer. The safety factors shall not be reduced by any modifications. The crane plates and charts shall be changed to reflect any modifications made.

(c) A professional engineer shall certify that the crane foundations and underlying soil are adequate support for the tower crane with its maximum overturning movement.

(d) Tower cranes shall be positioned whereby they can swing 360° without either the counterweight or jib striking any building, structure or other object, except:

(i) If the crane can strike an object or another crane, suitable limit switches shall be installed which will prohibit contact with such objects, or;

(ii) Direct voice communications shall be established between any operator of the tower crane(s) involved and a signaller so stationed where the boom and/or counterweight movement, and the object with which it may contact can be observed so that the operator(s) can be warned of imminent danger.

(iii) A secondary means of positive communications shall be established as a back-up for possible direct voice communication failure.

(iv) Radio communication systems without tone coded squelch are prohibited. Citizens band radios shall not be used as a means of communications for tower cranes.

(e) Prior to installing a climbing tower crane within an existing building or new construction, a structural engineer shall certify that the building is designed to withstand the torque and floor loading created by the crane to be installed.

(f) Tower cranes erected on a new foundation shall be tested in accordance with ANSI B30.3-1990 Chapter 3-1.

(i) The test shall consist of suspending a load of not less than 110% of the rated capacity for 15 minutes. The load shall be suspended from the furthest point of the length of boom (jib) to be used. The results of this test shall be within the manufacturer's recommendations and/or specifications.

(ii) A record of each test shall be made and signed by the person responsible for conducting the test. Such records shall be maintained on the construction site for the duration of the construction work for which it was erected and subsequently

made a part of the firm's permanent equipment records. Records shall be made available to authorized representatives of the department, upon request.

(g) A capacity chart shall be furnished by each crane manufacturer which shall include a full and complete range of crane load ratings at all stated operating radii for each allowable speed and each recommended counterweight load.

(i) Such chart shall be posted in the operator's cab or at the remote control stand in use. In lieu of the chart at the remote control stand, a minimum of two weight capacity signs shall be affixed to the jib or boom.

(ii) The chart shall be visible and readable to the operator while at the normal operating position.

(h) Operating controls shall be properly marked to indicate the function of the controls in each position.

(i) An operating and maintenance manual written in the English language shall be provided with each tower crane.

(j) Limit switches shall be installed and shall be kept properly adjusted. They shall be protected or isolated in a manner which will prevent unauthorized tampering. Limit switches shall provide the following functions:

(i) Safely limit the travel of the trolley to prevent it from hitting the outer end of the jib.

(ii) Limit the upward travel of the load block to prevent two-blocking.

(iii) Lower over travel limiting devices shall be provided for all load hoists where the hook area is not visible to the operator.

(iv) Limit the load being lifted in a manner whereby no more than 110% of the maximum rated load can be lifted or moved.

(k) The crane shall not be used to pull vehicles of any type, remove piling, loosen form work, pull away loads which are attached to the ground or walls, or for any operation other than the proper handling of freely suspended loads.

(l) When the operator may be exposed to the hazard of falling objects, the tower crane cab and/or remote control station shall have adequate overhead protection.

(m) The operator shall be protected from the weather. If enclosed cabs are provided they shall provide clear visibility in all directions and glass shall be approved safety glass or the equivalent.

(n) An approved and safe means shall be provided for access to operator's cab and machinery platform.

(o) When necessary for inspection or maintenance purposes, ladders, walkways with railing or other devices shall be provided.

(p) Each tower crane shall be provided with a slewing brake capable of preventing the jib or boom from rotating in either direction and stopping the rotation of the jib or boom while loaded, when desired. Such brake shall have a holding device which, when set, will hold the jib or boom in a fixed location without additional attention of the operator. When the crane is out of operation, the jib or boom shall be pointed downwind and the slewing brake shall be released so as to permit the jib or boom to weathervane, providing the jib or boom has a clear 360 degree rotation. Where a 360 degree rotation is not provided, the jib or boom shall be pointed downwind from the prevailing wind and the slewing brake set.

(q) Each tower crane shall be provided with a braking system on the trolley capable of stopping and holding the trolley in any desired position while carrying a maximum load. This brake shall be capable of being locked in a fixed location without additional attention of the operator. An automatic brake or device shall be installed which will immediately stop and lock the trolley in position in the event of a breakage of the trolley rope.

(r) All electrical equipment shall be properly grounded and protection shall be provided against lightning.

(s) When the operator is actually operating the crane, the operator shall remain in a stationary position.

(t) All crane brakes shall automatically set in event of power failure. Swing brakes shall also function in this manner or be capable of being set manually.

(u) Climbing jack systems used for raising a tower crane shall be equipped with over-pressure relief valves, direct-reading pressure gauges, and pilot-operated hydraulic check valves installed in a manner which will prevent jack from retracting should a hydraulic line or fitting rupture or fail.

(v) During periods of high winds or weather affecting visibility, i.e., fog, etc., only loads shall be handled that are consistent with good safety practices. Good safety practices shall be mutually agreed upon by the operator and the person in charge of the construction job, with due consideration given to manufacturer's specifications and recommendations.

(w) Counterweights shall be securely fastened in place and shall not exceed the weight as recommended by the manufacturer for the length of jib being used. However, an amount of counterweight as recommended by the manufacturer shall be used.

(x) Tower cranes shall be inspected and maintained in accordance with the manufacturer's recommendations or more frequently if there is reason to suspect a possible defect or weakening of any portion of the structure or equipment.

(y) Guy wires, wedges, braces or other supports shall be inspected at the beginning and at midpoint of each working shift to ascertain that they are functioning as intended.

(6) Additional tower crane requirements.

(a) An approved method must be instituted for transmitting signals to the operator. Standard hand signals for crane operations must be used, whenever possible; however, if conditions are such that hand signals are ineffective, radio-controlled or electric-whistle signal or two-way voice communication must be used. (See WAC 296-155-525 (5)(d).)

(b) Tower cranes shall not be erected or raised when the wind velocity at the worksite exceeds 20 m.p.h. or that specified by the manufacturer.

(c) Tower crane operators shall be trained and experienced in tower crane operations; however, for gaining experience, persons may operate the tower crane if under the immediate supervision of an experienced operator.

(d) Adequate clearance shall be maintained between moving and rotating structures of the crane and fixed objects to allow the passage of employees without harm.

(e) Employees required to perform duties on the horizontal boom of hammerhead tower cranes shall be protected against falling by guardrails or by a full body harness and lanyards attached to crane or to lifelines in conformance with Part C-1 of this chapter.

(f) Buffers shall be provided at both ends of travel of the trolley.

(g) Cranes mounted on rail tracks shall be equipped with limit switches limiting the travel of the crane on the track and stops or buffers at each end of the tracks.

(h) All hammerhead tower cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed by the manufacturer.

(i) Access ladders inside the telescoping sections of tower cranes are exempt from those sections of the safety standards pertaining to cleat length and cleat spacing, but shall conform to manufacturer's recommendations and specifications.

(7) Overhead and gantry cranes.

(a) The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, and this marking shall be clearly legible from the ground or floor.

(b) Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

(c) Except for floor-operated cranes, a gong or other effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

(d) All overhead and gantry cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in ANSI B30.2.0-1990, Safety Code for Overhead and Gantry Cranes.

(8) Derricks. All derricks in use shall meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation as prescribed in American National Standard Institute B30.6-1990, Safety Code for Derricks.

(9) Floating cranes and derricks.

(a) Mobile cranes mounted on barges.

(i) When a mobile crane is mounted on a barge, the rated load of the crane shall not exceed the original capacity specified by the manufacturer.

(ii) A load rating chart, with clearly legible letters and figures, shall be provided with each crane, and securely fixed at a location easily visible to the operator.

(iii) When load ratings are reduced to stay within the limits for list of the barge with a crane mounted on it, a new load rating chart shall be provided.

(iv) Mobile cranes on barges shall be positively secured.

(b) Permanently mounted floating cranes and derricks.

(i) When cranes and derricks are permanently installed on a barge, the capacity and limitations of use shall be based on competent design criteria.

(ii) A load rating chart with clearly legible letters and figures shall be provided and securely fixed at a location easily visible to the operator.

(iii) Floating cranes and floating derricks in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, and operation as prescribed by the manufacturer.

(c) Protection of employees working on barges. The employer shall comply with the applicable requirements for protection of employees as specified in WAC 296-155-630.

(10) Mobile cranes and excavation machines.

(a) In all power driven shovel operations the person in charge shall issue instructions necessary to prevent accidents, to detect and correct unsafe acts and dangerous conditions, and to enforce all safety rules and regulations.

The person in charge shall also issue instructions on the proper method of using tools and handling material.

(b) Where the ground is soft or uneven, timbering and planking shall be used to provide firm foundation and distribute the load.

(c) In case of a breakdown, the shovel shall be moved away from the foot of the slope before repairs are made.

(d) All persons shall keep away from the range of the shovel's swing and shall not be permitted to stand back of the shovel or in line with the swing of the dipper during operation or moving of shovel.

(e) Unauthorized persons shall not be allowed on the shovel during operations, and the operator shall not converse with other persons while operating machine.

(f) The shovel dipper shall rest on the ground or on blocking during shut down periods.

(g) Shovels shall be inspected daily and all defects promptly repaired.

(h) All rubber tired mobile cranes shall be equipped with outriggers and sufficient blocking to properly stabilize crane while operating.

(i) Rubber tired mobile cranes shall be equipped with rear view mirrors.

(j) Positive boom stops shall be provided on all mobile cranes of the wheel and crawler type.

(k) Length of a crane boom and amount of counterweight shall not exceed manufacturer's rated capacity for equipment involved; except on isolated cases where permission is granted by the department.

(l) On all cranes where wedge brackets are used as terminal connections, the proper size wedge shall be used.

(m) On all mobile cranes, the hoist and boom drums shall be provided with a positive operated pawl or dog which shall be used in addition to the brake to hold the load and boom when they are suspended. Counterweight operated dogs are prohibited.

(n) Oiling and greasing shall be done under safe conditions with machine at rest, except when motion of machine is necessary.

(o) All steps, running boards, and boom ladder shall be of substantial construction and in good repair at all times.

(p) Operators shall not leave the cab while master clutch is engaged.

(q) Fire extinguishers shall be readily accessible and within reach of operator at all times.

(r) All shovel and crane cabs shall be kept clean and free of excess oil and grease on floor and machinery. Oily and greasy rags shall be disposed of immediately after use and not allowed to accumulate.

(s) Tools shall not be left on the cab floor. Spare cans of oil or fuel, and spare parts, shall not be stored in cabs, except in approved racks provided for that purpose.

(t) Mats or planking shall be used in moving shovels or cranes over soft or uneven ground.

(u) Cranes or shovels setting on steep grades shall be securely blocked or secured with a tail hold.

(v) Smoking shall be prohibited while fueling or oiling machines.

(w) Gasoline powered motors shall be stopped during refueling.

(x) Handling of movable feed line (bologna) shall be accomplished with insulated hooks and lineman's rubber gloves.

(y) Where cables cross roads they shall be elevated or placed in a trench.

(z) On all power shovels, including back-hoe types, of one-half cubic yard capacity or over, and on all dragline cranes or all-purpose cranes of the crawler or wheel type, two persons shall constitute the minimum working crew. It is mandatory that one be a qualified operator of the equipment in use. The job title of the other crew member may be oiler, rigger, signal person, or a laborer. The primary purpose of the second crew member is to signal the operator when the operator's vision is impaired or obscured and to be on-hand in case of emergency.

(i) Second-crew persons shall be properly trained in their second-person required skills.

(ii) The second crew member shall be close enough to the machine in operation to be aware of any emergency, if one arises, and to assure the machine is operated with necessary and appropriate signals to the operator.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-055, § 296-155-525, filed 10/3/05, effective 12/1/05; 05-03-093, § 296-155-525, filed 1/18/05, effective 3/1/05; 04-14-028, § 296-155-525, filed 6/29/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050. 02-12-098, § 296-155-525, filed 6/5/02, effective 8/1/02; 01-17-033, § 296-155-525, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-155-525, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-525, filed 1/10/91, effective 2/12/91; Order 76-29, § 296-155-525, filed 9/30/76; Order 74-26, § 296-155-525, filed 5/7/74, effective 6/6/74.]

### **WAC 296-155-526 Crane attached personnel platforms. (1) Scope, application, and definitions.**

(a) **Scope and application.** This standard applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms attached to the boom of cranes. Crane attached personnel platforms must meet the applicable requirements for design, inspection, construction, testing, maintenance, and operation as prescribed in the ASME B30.23-1998 safety code for Personnel Lifting Systems.

(b) **Definitions.** For the purposes of this section, the following definitions apply:

**"Failure"** means load refusal, breakage, or separation of components.

**"Lift"** (or lifting) refers to all crane functions such as hoisting, lowering, swinging, booming in and out or up and down, or moving an attached personnel platform.

**"Load refusal"** means the point where the ultimate strength is exceeded.

**"Runway"** means a firm, level surface, designed, prepared, and designated as a path of travel for the weight and

configuration of the crane being used to lift and travel with the attached crane platform. An existing surface may be used as long as it meets these criteria.

(2) **General requirements.** The use of a crane to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

(3) **Cranes requirements.**

(a) All lifting operations must be performed in accordance with the manufacturer's requirements.

(b) Hoist lines must be removed and stowed or an anti two-block device installed.

(c) Lifting of the personnel platform must be performed in a slow, controlled manner with no sudden movements of the crane or the platform.

(d) Load and boom hoist drum brakes, swing brakes, and locking devices, such as pawls or dogs, must be engaged when the personnel platform is occupied in a stationary working position.

(e) The crane must be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers must follow manufacturer's requirements for use.

(f) The total weight of the loaded personnel platform must not exceed fifty percent of the rated capacity for the radius and configuration of the crane as required by load chart specifications.

(g) The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

(4) **Instruments and components.**

(a) Cranes with variable angle booms must be equipped with a boom angle indicator, readily visible to the operator.

(b) Cranes with telescoping booms must be equipped with a device that at all times clearly indicates the boom's extended length to the operator. An accurate determination of the load radius, to be used during the lift, must be made before hoisting personnel.

(5) **Personnel platforms - design criteria.**

(a) A qualified engineer must design the personnel platform and attachment system.

(b) The attachment system must be designed to minimize tipping of the platform to no more than ten degrees from horizontal.

(c) The platform design must incorporate a motion control device that stabilizes the platform while being held in a working position.

(d) The personnel platform, excluding the guardrail system and body harness anchorages, must be capable of supporting, without failure, its own weight and at least five times the maximum intended load—based on a minimum allowance of five hundred pounds for the first person with light tools, and an additional two hundred fifty pounds for each additional person.

(e) Criteria for guardrail systems contained in chapter 296-155 WAC, Part K and body harness anchorages are contained in chapter 296-155 WAC, Part C will be followed.

(f) A plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load, must be conspicuously posted on the personnel platform.

(6) **Platform specifications.**

(a) Each personnel platform must be equipped with a guardrail system which meets the requirements of chapter 296-155 WAC, Part K. The personnel platform must also be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than one-half inch (1.27 cm).

(b) A grab rail must be installed inside the entire perimeter of the personnel platform.

(c) Access gates, if installed, must not swing outward during hoisting.

(d) Access gates, including sliding or folding gates, must be equipped with a restraining device to prevent accidental opening.

(e) Employees must have sufficient headroom to stand upright on the platform.

(f) All rough edges exposed to contact by employees must be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

(g) A qualified welder familiar with the weld grades and types must perform all welding of the personnel platform and its components, with material specified in the platform design.

(7) **Personnel platform loading.**

(a) The personnel platform must not be loaded in excess of its rated load capacity.

(b) The number of employees on the personnel platform must not exceed the number required for the work to be performed.

(c) Personnel platforms must be used only for employees, tools, and materials necessary to do the work. Personnel platforms will not be used to hoist materials or tools without an employee on the platform (except to perform a trial lift or proof test as described in subsection (8) of this section).

(d) Materials and tools must be secured to prevent displacement.

(e) Materials and tools must be evenly distributed, within the confines of the platform, while work is being performed.

(f) Employees must keep their feet in contact with the floor of the platform at all times.

(8) **Prelift meeting.**

(a) A meeting attended by the crane operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed must be held to review the appropriate requirements of this section and the procedures to be followed.

(b) This meeting must be held before the trial lift at each new work location, and must be repeated for any employees newly assigned to the operation.

(9) **Trial lift, inspection, and proof testing.**

(a) A trial lift with an unoccupied personnel platform loaded at least to the anticipated lift weight must be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift must be performed immediately prior to allowing employees on the platform. The operator must determine that:

- All systems, controls, and safety devices are activated and functioning properly;
- No interferences exist; and
- All configurations necessary to reach work locations will allow the operator to remain under the fifty percent limit of the crane's rated capacity.

• Materials and tools to be used during the actual lift must be loaded in the platform, as provided in subsection (7) of this section, for the trial lift.

Note: A single trial lift may be performed for all locations that are to be reached from a single set-up position.

(b) The trial lift must be repeated:

• Prior to hoisting employees whenever the crane is moved and set up in a new location, or returned to a previously used location.

• A meeting attended by the crane operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed must be held to review the appropriate requirements of this section and the procedures to be followed.

(c) After the trial lift:

• But prior to hoisting personnel, the platform must be hoisted a few inches and inspected to ensure that it is secure and properly balanced.

• A visual inspection of the crane, personnel platform, and the crane base support or ground must be conducted by a competent person to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

(d) Deficiencies found during inspection, or operation, which create a safety hazard, must be corrected before hoisting personnel.

(e) The platform must be proof tested:

- At each job site;
- Prior to hoisting employees on the personnel platform; and
- After any repair or modification.

(i) For the proof test, one hundred twenty-five percent of the platform's rated capacity will be hoisted and held in a suspended position for five minutes. The proof test load must be evenly distributed on the platform.

(ii) After each proof test a competent person must inspect the platform and rigging.

(iii) Deficiencies found during proof testing must be corrected, and another proof test conducted. Employees must not be hoisted until a deficiency free proof test has been achieved.

Note: Proof testing may be done concurrently with the required trial lift.

(10) **Work practices.**

(a) Employees must keep all parts of the body inside the platform during raising, lowering, and positioning, except when performing the duties of a signal person.

(b) Before entering or exiting a personnel platform that is not landed, the platform must be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

(c) The crane operator must remain at the controls at all times when the platform is occupied.

(d) Employee lifting must be promptly discontinued upon indication of any dangerous weather conditions.

(e) Employees being lifted must remain in continuous sight of and in direct communication with the operator or signal person. Any disruption in communications will cause operations to be immediately discontinued. Signals to the operator will be in accordance with section 5-3.3, ASME B30.5 1994 and this section.

(f) In situations where direct visual contact with the operator is not possible, or the use of a signal person may be hazardous for that person, direct communication alone, such as by radio, may be used. If a secure radio frequency is not available, hard-wired voice communication will be used. When using voice commands, there will be a continuous pause between commands of one-second duration per ten feet to the desired lift height or any contact point.

(g) The following voice commands are recommended for use:

- Boom up.
- Boom down.
- Swing left.
- Swing Right.
- Extend out.
- Retract in.
- Stop.

Note: If special voice commands are required to perform the lift safely, they must be mutually agreed upon between the designated signal person and the crane operator before the lift procedure starts.

(h) Employees on a personnel platform must use a full body harness system with lanyard appropriately attached to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage as specified in chapter 296-155 WAC, Part C.

(i) Lifts must not be made on the crane's load lines while personnel are working from an attached platform.

(11) **Traveling.**

(a) Lifting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(b) Under any circumstances where a crane would travel while lifting personnel, the employer must implement the following procedures to safeguard employees:

(i) Crane travel must be restricted to a fixed track or runway;

(ii) Travel must be limited to the load radius of the boom used during the lift; and

(iii) The boom must be parallel to the direction of travel.

(c) A complete trial run must be performed before employees are allowed to occupy the platform.

Note: This trial run can be performed concurrent with the trial lift required by subsection (8) of this section.

(d) If travel is done with a rubber tired-carrier, the condition and air pressure of the tires must be checked. The chart capacity for lifts on rubber must be used for application of the fifty percent reduction of rated capacity. Notwithstanding the requirements of subsection (3) of this section, outriggers may be partially retracted as necessary for travel.

(12) **Communication.** When using verbal signals, clarity and precision are essential for safe operation. Operators must be able to communicate with others at the worksite suf-

ficiently to understand the signs, notices, operation instructions, and the signal code to be used.

[Statutory Authority: RCW 49.17.010, [49.17.]040 and [49.17.]050. 00-15-028, § 296-155-526, filed 7/12/00, effective 10/1/00.]

**WAC 296-155-527 Appendix A to WAC 296-155-525.** Due to crane design configuration to maintain mobility, sheave diameters and rope, design factors are limited. Because of these limited design parameters, inspection to detect deterioration in accordance with subsections below and timely replacement are essential.

(1) Frequent inspection.

(a) All running ropes in service should be visually inspected once each working day. A visual inspection shall consist of observation of all rope which can reasonably be expected to be in use during the day's operations. These visual observations should be concerned with discovering gross damage, such as listed below, which may be an immediate hazard:

(i) Distortion of the rope such as kinking, crushing, unstranding, birdcaging, main strand displacement, or core protrusion. Loss of rope diameter in a short rope length or unevenness of outer strands should provide evidence that the rope or ropes must be replaced.

(ii) General corrosion.

(iii) Broken or cut strands.

(iv) Number, distribution and type of visible broken wires. (See subsection below for further guidance.)

(v) Core failure in rotation resistant ropes. When such damage is discovered the rope shall be either removed from service or given an inspection as detailed in periodic inspection.

(b) Care shall be taken when inspecting sections of rapid deterioration such as flange points, crossover points and repetitive pickup points on drums.

(c) Care shall be taken when inspecting certain ropes such as the following:

(i) Rotation resistant ropes, because of their higher susceptibility to damage and increased deterioration when working on equipment with limited design parameters. The internal deterioration of rotation resistant ropes may not be readily observable.

(ii) Boom hoist ropes, because of the difficulties of inspection and the important nature of these ropes.

(2) Periodic inspection.

(a) The inspection frequency shall be determined by a qualified person and shall be based on such factors as expected rope life as determined by experience on the particular installation or similar installations, severity of environment, percentage of capacity lifts, frequency rates of operation, and exposure to shock loads. Inspections need not be at equal calendar intervals and should be more frequent as the rope approaches the end of its useful life. This inspection shall be performed at least annually.

(b) Periodic inspections shall be performed by a qualified person. This inspection shall cover the entire length of rope. Only the surface wires of the rope need be inspected. No attempt should be made to open the rope. Any deterioration resulting in an appreciable loss of original strength, such as described below, shall be noted and determination made as to whether further use of the rope would constitute a hazard:

(i) Points listed in subsection (1) of this section (Frequent inspection).

(ii) Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

(iii) Severely corroded or broken wires at end connections.

(c) Care shall be taken when inspecting sections of rapid deterioration, such as the following:

(i) Sections in contact with saddles, equalizer sheaves, or other sheaves where rope travel is limited;

(ii) Sections of the rope at or near terminal ends where corroded or broken wires may protrude.

(3) Rope replacement.

(a) No precise rules can be given for determination of the exact time for replacement of rope, since many variable factors are involved. Continued use in this respect depends largely upon good judgment by an appointed or authorized person in evaluating remaining strength in a used rope after allowance for deterioration disclosed by inspection. Continued rope operations depends upon this remaining strength.

(b) Conditions such as the following shall be sufficient reason for questioning continued use of the rope or increasing the frequency of inspection:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay (for special conditions relating to rotation resistant rope refer to paragraph 5-3.2.1.1 (d)(1)(b) ANSI/ASME B30.5 1989).

(ii) One outer wire broken at the point of contact with the core of the rope which has worked its way out of the rope structure and protrudes or loops out from the rope structure. Additional inspection of this section is required.

(iii) Wear of one-third the original diameter of outside individual wires.

(iv) Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure.

(v) Evidence of any heat damage from any cause.

(vi) Reductions from nominal diameter of more than:

(A) 1/64 in. (0.4 mm) for diameters up to and including 5/16 in. (8.0 mm);

(B) 1/32 in. (0.8 mm) for diameters 3/8 in. (9.5 mm) to and including 1/2 in. (13.0 mm);

(C) 3/64 in. (1.2 mm) for diameters 9/16 in. (14.5 mm) to and including 3/4 in. (19.0 mm);

(D) 1/16 in. (1.6 mm) for diameters 7/8 in. (22.0 mm) to and including 1 1/8 in. (29.0 mm);

(E) 3/32 in. (2.4 mm) for diameters 1 1/4 in. (32.0 mm) to and including 1 1/2 in. (38.0 mm).

(vii) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(c) Replacement rope shall have a strength rating at least as great as the original rope furnished or recommended by the crane manufacturer. Any deviation from the original size, grade, or construction shall be specified by a rope manufacturer, the crane manufacturer or a qualified person.

(d) Rope not in regular use. All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given an inspection before it is placed in service. This inspection shall be for all

types of deterioration and shall be performed by an appointed or authorized person.

(e) Inspection records:

(i) Frequent inspection; no records required.

(ii) Periodic inspection: In order to establish data as a basis for judging the proper time for replacement, a dated report of rope condition at each periodic inspection shall be kept on file. This report shall cover points of deterioration. If the rope is replaced only that part need be recorded.

(f) A long-range inspection program should be established and should include records on the examination of ropes removed from service so that a relationship can be established between visual observation and actual condition of the internal structure.

(4) Rope maintenance.

(a) Rope should be stored to prevent damage or deterioration.

(b) Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with care to avoid kinking or inducing a twist.

(c) Before cutting a rope, seizings shall be placed on each side of the place where the rope is to be cut to prevent unlaying of the strands. On preformed rope, one seizing on each side of the cut is required. On nonpreformed ropes of 7/8 in. (22 mm) diameter or smaller, two seizings on each side of the cut are required, and for nonpreformed rope of 1 in. (26 mm) diameter or larger, three seizings on each side of the cut are required.

(d) During installation, care should be exercised to avoid dragging of the rope in dirt or around objects which will scrape, nick, crush, or induce sharp bends in it.

(e) Rope should be maintained in a well lubricated condition. It is important that lubricant applied as part of a maintenance program shall be compatible with the original lubricant, and to this end, the rope manufacturer should be consulted; lubricant applied shall be of the type which does not hinder visual inspection. Those sections of rope which are located over sheaves or otherwise hidden during inspection and maintenance procedures require special attention when lubricating rope. The object of rope lubrication is to reduce internal friction and to prevent corrosion.

(f) When an operating rope shows greater wear at well-defined localized areas than on the remainder of the rope, rope life can be extended (in cases where a reduced rope length is adequate) by cutting off a section at the worn end, and thus shifting the wear to different areas of the rope.

(5) Operating near electric power lines:

(a) Cranes shall be operated so that no part of the crane or load enters into the danger zone.

Exceptions: The danger zone may be entered if the electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work; or the danger zone may be entered if insulating barriers (not a part of nor an attachment to the crane) have been erected to prevent physical contact with the lines.

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load (including handling appendages) shall be 10 feet (3 m).

(ii) Caution shall be exercised when working near overhead lines because they can move horizontally or vertically due to wind, moving the danger zone to new positions.

(iii) While in transit with no load and boom lowered, the clearance shall be as specified in WAC 296-155-525 (3)(e).

(iv) A qualified signal person shall be assigned to observe the clearance when the crane moves to within a boom's length of the limits specified in WAC 296-155-525 (3)(e). The operator is not in the best position to judge distance between the power line and the crane or its protuberances.

(b) If cage-type boom guards, insulating links, or proximity warning devices are used on cranes, such devices shall not be a substitute for the requirements of WAC 296-155-525 (3)(e), even if such devices are required by law or regulation. In view of the complex, invisible, and lethal nature of the electrical hazard involved, and to lessen the potential of false security, limitations of such devices, if used, shall be understood by operating personnel and tested in the manner and intervals prescribed by the manufacturer of the device. Compliance with WAC 296-155-525 (3)(e) is the recommended practice of this regulation in determining permissible proximity of the crane and its protuberances, including load, to electrical power lines.

(c) Before the commencement of operations near electrical lines, the person responsible for the job shall notify the owners of the lines or their authorized representatives, provide them with all pertinent information, and request their cooperation.

(d) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities verify that it is not an energized line.

(e) Exceptions to this procedure, if approved by the owner of the electrical lines, may be granted by the administrative or regulatory authority if the alternate procedure provides protection and is set forth in writing.

(f) Durable signs shall be installed at the operator's station and on the outside of the crane warning that electrocution or serious bodily injury may occur unless a minimum clearance of 10 feet (3 m) is maintained between the crane or the load being handled and energized power lines. Greater clearances are required because of higher voltage as stated in WAC 296-155-525 (3)(e). These signs shall be revised when local jurisdiction requires greater clearances.

(6) Site preparation and erection.

(a) All load bearing foundations, supports, and rail tracks shall be constructed or installed to support the crane loads and to transmit them to the soil or other support medium. In addition to supporting vertical load, foundations and supports, rail supports excepted, should be designed to provide a moment resisting overturning equal to a minimum of 150% of the maximum crane overturning moment.

(b) Rails should be level and straight, unless specifically designed for curves or grades, and properly spaced for the crane trucks in accordance with the manufacturer's specifications. The track and support system should have sufficient rigidity to limit dynamic oscillations and deviations from plumb.

(c) Rails shall be securely attached to the supporting surface in a manner capable of resisting the horizontal and vertical loads specified by the manufacturer. When applicable, provisions should be made for thermal expansion and contraction.

(d) Splices in rail tracks (bolted or welded) shall have smooth joints.

(e) When required, a designated portion of the track should be arranged and constructed as an out-of-service parking area complete with means needed for supporting the crane against storm wind effects and anchoring it against unwanted movement along the track; the parking track should be in place before erection commences.

(f) Rails shall be electrically grounded when they carry cranes electrically powered from an outside source.

(g) Both ends of all tracks shall be provided with stops or buffers adjusted for simultaneous contact with both sides of the travel base.

(h) When more than one crane will be operating on a run of track, particular consideration should be given to the number and disposition of parking areas.

(i) The hazard of earthquake effects appropriated to the site or zone should be considered.

(j) The crane manufacturer shall provide maximum resulting loads at the base of the crane, or wheel loads, for use in design of the supports.

(7) General erection requirements.

(a) When cranes are erected, the manufacturer's or a qualified person's written erection instructions and a list of the weights of each component to be erected shall be at the site.

(b) Cranes shall be erected in accordance with the crane manufacturer's or a qualified person's recommendations. Erection shall be performed under the supervision of a qualified person.

(c) Procedures shall be established before erection work commences to implement the erection instructions and to adapt them to the particular needs of the site. The need for temporary guying and bracing during erection shall be established.

(d) Before crane components are erected, they shall be visually inspected for damage. Damaged members shall not be erected until repaired in accordance with the manufacturer's or qualified person's instructions, or replaced.

(e) Slings and lifting accessories shall be selected and arranged to avoid damaging or marring crane members during erection.

(f) Wind velocity at the site at the time of erection should be considered as a limiting factor that could require suspending the erection operation.

(g) Crane towers shall be erected plumb to a tolerance that is specified by the manufacturer.

(h) Cranes required to weathervane when out-of-service shall be installed with clearance for the boom and superstructure to swing a full 360° arc without striking a fixed object or other crane.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-11-055, § 296-155-527, filed 5/20/97, effective 8/1/97; 95-17-036, § 296-155-527, filed 8/9/95, effective 9/25/95.]

**WAC 296-155-528 Crane or derrick suspended personnel platforms.** (1) Scope, application, and definitions.

(a) Scope and application. This standard applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes or derricks.

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(b) Definitions. For the purposes of this section, the following definitions apply:

(i) "Failure" means load refusal, breakage, or separation of components.

(ii) "Hoist" (or hoisting) means all crane or derrick functions such as lowering, lifting, swinging, booming in and out or up and down, or suspending a personnel platform.

(iii) "Load refusal" means the point where the ultimate strength is exceeded.

(iv) "Maximum intended load" means the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

(v) "Runway" means a firm, level surface designed, prepared, and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

(2) General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

(3) Cranes and derricks.

(a) Operational criteria.

(b) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.

(c) Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 (required under WAC 296-155-525 (4)(b)) and applying the fifty percent derating of the crane capacity which is required by (f) of this subsection.

(d) Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

(e) The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

(f) The total weight of the loaded personnel platform and related rigging shall not exceed fifty percent of the rated capacity for the radius and configuration of the crane or derrick.

(g) The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

(h) Multiple-part line block: When a multiple-part line block is in use, a substantial strap shall be used between the crane hook and common ring, shackle, or other equivalent device, to eliminate employee exposure to the lines running through the block, and to the block itself.

(4) Instruments and components.

[Title 296 WAC—p. 2151]

(a) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

(b) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

(c) A positive acting device shall be used which prevents contact between the load block or overhaul ball and the boom tip (anti-two-blocking device), or a system shall be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

(d) The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.

(5) Rigging.

(a) Lifting bridles on box-type platforms shall consist of four legs of equal length, with one end securely shackled to each corner of the platform and the other end securely attached to a common ring, shackle, or other equivalent device to accommodate the crane hook, or a strap to the crane hook.

(b) Shackle bolts used for rigging of personnel platforms shall be secured against displacement.

(c) A substantial safety line shall pass through the eye of each leg of the bridle adjacent to the common ring, shackle, or equivalent device.

(d) Securely fastened with a minimum amount of slack to the lift line above the headache ball or to the crane hook itself.

(e) All eyes in wire rope slings shall be fabricated with thimbles.

(f) Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant wire rope is used for slings, they shall be capable of supporting without failure at least ten times the maximum intended load.

(g) Hooks on headache ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

(h) Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.

(6) Personnel platforms - design criteria.

(a) The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

(b) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

(c) The personnel platform itself, except the guardrail system and body harness anchorages, shall be capable of supporting, without failure, its own weight and at least five times

the maximum intended load based on a minimum allowance of five hundred pounds for the first person with light tools, and an additional two hundred fifty pounds for each additional person.

(d) Criteria for guardrail systems contained in chapter 296-155 WAC, Part K and body harness anchorages are contained in chapter 296-155 WAC, Part C-1.

(e) The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

(7) Platform specifications.

(a) Each personnel platform shall be equipped with a guardrail system which meets the requirements of chapter 296-155 WAC, Part K and, shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than one-half inch (1.27 cm).

(b) A grab rail shall be installed inside the entire perimeter of the personnel platform.

(c) Access gates, if installed, shall not swing outward during hoisting.

(d) Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

(e) Headroom shall be provided which allows employees to stand upright in the platform.

(f) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

(g) All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

(h) All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types, and material specified in the platform design.

(i) Occupants of all personnel platforms shall wear a safety belt or harness and lanyard which meets the requirements of chapter 296-155 WAC, Part C-1.

(j) Box-type platform: The workers lanyard shall be secured to an anchorage within the platform meeting the requirements of chapter 296-155 WAC, Part C-1.

(k) Rescue platform:

(i) If the platform is used as a rescue vehicle, the injured worker shall be strapped into the stretcher or basket.

(ii) The basket shall then be secured by lanyard to an anchorage within the platform meeting the requirements of chapter 296-155 WAC, Part C-1.

(l) Boatswains chair: The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(m) Barrel-type platform:

(i) The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(ii) A solid bar or rod shall be substantially attached in a rigid position to the bottom or side of the platform.

(iii) The bottom of the barrel-type platform shall be of a convex shape to cause the platform to lay on its side when lowered to the ground or floor.

(iv) The bar or rod shall extend a minimum of eight feet above the floor of the platform.

(v) Workers shall enter and exit from barrel-type platforms only when they are in an upright position, stable, and securely attached to the load line.

(vi) The employer shall use methods or devices which allow employees to safely enter or exit barrel-type platforms.

(8) Personnel platform loading.

(a) The personnel platform shall not be loaded in excess of its rated load capacity.

(b) The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.

(c) Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.

(d) Materials and tools for use during a personnel lift shall be secured to prevent displacement.

(e) Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended.

(9) Trial lift, inspection, and proof testing.

(a) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the fifty percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in subsection (8)(d) and (e) of this section for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set-up position.

(b) The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).

(c) After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:

(i) Hoist ropes shall be free of kinks;

(ii) Multiple part lines shall not be twisted around each other;

(iii) The primary attachment shall be centered over the platform; and

(iv) The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

(d) A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or

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ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

(e) Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

(f) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to one hundred twenty-five percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

(10) Work practices.

(a) Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

(b) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

(c) Tag lines shall be used unless their use creates an unsafe condition.

(d) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

(e) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

(f) Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone such as by radio may be used.

(g) Hand signals to the operator shall be in accordance with WAC 296-155-525 (2)(c).

(h) Except over water, employees occupying the personnel platform shall use a full body harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage as specified in chapter 296-155 WAC, Part C-1. When working over water, the requirements of WAC 296-155-235 shall apply.

No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.

(11) Traveling.

(a) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(b) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:

(i) Crane travel shall be restricted to a fixed track or runway;

(ii) Travel shall be limited to the load radius of the boom used during the lift; and

(iii) The boom must be parallel to the direction of travel.

(c) A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by subsection (9)(a) of this section which tests the route of the lift.

(d) If travel is done with a rubber tired-carrier, the condition and air pressure of the tires shall be checked. The chart capacity for lifts on rubber shall be used for application of the fifty percent reduction of rated capacity. Notwithstanding subsection (3)(e) of this section, outriggers may be partially retracted as necessary for travel.

(12) Prelift meeting.

(a) A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review the appropriate requirements of this section and the procedures to be followed.

(b) This meeting shall be held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-528, filed 2/13/98, effective 4/15/98.]

**WAC 296-155-530 Material hoists, personnel hoists, and elevators. (1) General requirements.**

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of all hoists and elevators. Where the manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a professional engineer competent in the field.

(b) The employer shall ensure that no person shall enter a hoistway, elevator shaft, or similar enclosure in which the hoisting apparatus or vehicle is installed and functioning unless the power source operating those systems is locked out in accordance with WAC 296-155-429.

(c) Rated load capacities, recommended operating speeds, and special hazard warning or instructions shall be posted on cars and platforms.

(d) Wire rope shall be removed from service when any of the following conditions exists:

(i) In hoisting ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay;

(ii) Abrasion, scrubbing, flattening, or peening, causing loss of more than one-third of the original diameter of the outside wires;

(iii) Evidence of any heat damage resulting from a torch or any damage caused by contact with electrical wires;

(iv) Reduction from nominal diameter of more than three sixty-fourths inch for diameters up to and including three-fourths inch; one-sixteenth inch for diameters seven-eighths to 1 1/8 inches; and three thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches.

(e) Hoisting ropes shall be installed in accordance with the wire rope manufacturer's recommendations.

(f) The installation of live booms on hoists is prohibited.

(g) The use of endless belt-type man lifts on construction shall be prohibited.

(h) Employees shall not be permitted to ride on top of material hoists, personnel hoists or permanent elevators except for purposes of inspection, maintenance, elevator installation or dismantling work.

(2) Material hoists, (a)(i) Operating rules shall be established and posted at the operator's station of the hoist. Such rules shall include signal system and allowable line speed for various loads. Rules and notices shall be posted on the car frame or crosshead in a conspicuous location, including the statement "No riders allowed."

(ii) No person shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.

(b) All entrances of the hoistways shall be protected by substantial gates or bars which shall guard the full width of the landing entrance. All hoistway entrance bars and gates shall be painted with diagonal contrasting colors, such as black and yellow stripes.

(i) Bars shall be not less than 2- by 4-inch wooden bars or the equivalent, located 2 feet from the hoistway line. Bars shall be located not less than 36 inches nor more than 42 inches above the floor.

(ii) Gates or bars protecting the entrances to hoistway shall be equipped with a latching device.

(c) Overhead protective covering of two-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every material hoist cage or platform to prevent objects falling on the workers loading or unloading the hoist.

(i) The protective covering on the top of the cage or platform may be made in hinged sections that may be raised when hoisting long material.

(ii) When using a cage or platform for long material, the several pieces of the material shall be securely fastened together and made fast to the cage or platform, so that no part of the load can fall or project beyond the sides of the cage or platform.

(d) The operator's station of a hoisting machine shall be provided with overhead protection equivalent to tight planking not less than 2 inches thick. The support for the overhead protection shall be of equal strength.

(e) Hoist towers may be used with or without an enclosure on all sides. However, whichever alternative is chosen, the following applicable conditions shall be met:

(i) When a hoist tower is enclosed, it shall be enclosed on all sides for its entire height with a screen enclosure of 1/2-inch mesh, No. 18 U.S. gauge wire or equivalent, except for landing access.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 1/2-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading. A 6-foot high enclosure shall be provided on the unused sides of the hoist tower at ground level.

(f) Car arresting devices shall be installed to function in case of rope failure.

(g) All material hoist towers shall be designed by a licensed professional engineer.

(h) All material hoists shall conform to the requirements of ANSI A10.5-1969, Safety Requirements for Material Hoists.

(3) Personnel hoists.

(a) Personnel hoists shall be provided for access and egress on all multi story buildings where vertical travel exceeds sixty feet from a ground level access point.

(b) Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure shall be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such floors or scaffolds.

(c) Towers inside of structures shall be enclosed on all four sides throughout the full height.

(d) Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed. Where tie-ins are not practical the tower shall be anchored by means of guys made of wire rope at least one-half inch in diameter, securely fastened to anchorages to ensure stability.

(e) Hoistway doors or gates shall be not less than 6 feet 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.

(f) Cars shall be permanently enclosed on all sides and the top, except sides used for entrance and exit, which have car gates or doors.

(g) A door or gate shall be provided at each entrance to the car which shall protect the full width and height of the car entrance opening.

(h) Overhead protective covering of 2-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every personnel hoist.

(i) Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open.

(j) A signal device shall be installed in the elevator car and only operated by an attendant who shall give the signals for operation, when transporting workers.

(k) An electrical push button signalling device or other approved signalling system shall be provided at each floor landing connected to an annunciator in the car. The signal code shall be posted adjacent to the signal device at each and every work level and at operator's work level. All wording shall be black on a white card, in large clear letters.

(l) The elevator machine and controls shall be housed in as a protection against accidents and the weather, and the door kept locked against unauthorized entrance when operator is not in attendance.

(m) Safeties shall be capable of stopping and holding the car and rated load when traveling at governor tripping speed.

(n) Cars shall be provided with a capacity and data plate secured in a conspicuous place on the car or crosshead.

(o) Internal combustion engines shall not be permitted for direct drive.

(p) Normal and final terminal stopping devices shall be provided.

(q) An emergency stop switch shall be provided in the car and marked "stop."

(r) Ropes:

(i) The minimum number of hoisting ropes used shall be three for traction hoists and two for drum-type hoists.

(ii) The minimum diameter of hoisting and counter-weight wire ropes shall be 1/2-inch.

(iii) Safety factors:

MINIMUM FACTORS OF SAFETY FOR SUSPENSION WIRE ROPES

Rope speed in feet per minute:	Minimum factor of safety
50	7.60
75	7.75
100	7.95
125	8.10
150	8.25
175	8.40
200	8.60
225	8.75
250	8.90
300	9.20
350	9.50
400	9.75
450	10.00
500	10.25
550	10.45
600	10.70

(s) Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing installation. All hoists shall be inspected and tested at not more than 3-month intervals. Records shall be maintained and kept on file for the duration of the job.

(t) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists. The requirements of this subdivision do not apply to cantilever type personnel hoists.

(u) Wire rope shall be taken out of service when any of the following conditions exist:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;

(ii) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;

(iii) Evidence of any heat damage from any cause;

(iv) Reductions from nominal diameter of more than three-sixty-fourths inch for diameters to and including three-fourths inch, one sixteenth inch for diameter seven-eighths inch to 1 1/8 inches inclusive, three-thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches inclusive;

(v) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(v)(i) Personnel hoists used in bridge tower construction shall be approved by a registered professional engineer and erected under the supervision of a qualified engineer competent in this field.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 3/4-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading.

(iii) These hoists shall be inspected and maintained on a weekly basis. Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour it shall be inspected and put in operable condition before reuse.

(4) All elevators, manlifts or other lifting devices must be installed and maintained in conformity with the requirements specified in the Washington state elevator laws and regulations adopted by the elevator section of the department of labor and industries.

Note: For additional information refer to chapter 296-100 WAC, safety requirements for material hoists.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, 02-12-098, § 296-155-530, filed 6/5/02, effective 8/1/02. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-530, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-530, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-530, filed 1/21/86; Order 74-26, § 296-155-530, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-535 Base-mounted drum hoists. (1) General requirements.**

(a) Exposed moving parts such as gears, projecting screws, setscrews, chain, cables, chain sprockets, and reciprocating or rotating parts, which constitute a hazard, shall be guarded.

(b) All controls used during the normal operation cycle shall be located within easy reach of the operator's station.

(c) Electric motor operated hoists shall be provided with:

(i) A device to disconnect all motors from the line upon power failure and not permit any motor to be restarted until the controller handle is brought to the "off" position;

(ii) Where applicable, an overspeed preventive device;

(iii) A means whereby remotely operated hoists stop when any control is ineffective.

(d) All base-mounted drum hoists in use shall meet the applicable requirements for design, construction, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

(2) Specific requirements. (Reserved.)

[Order 74-26, § 296-155-535, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-540 Overhead hoists. (1) General requirements.**

(a) The safe working load of the overhead hoist, as determined by the manufacturer, shall be indicated on the hoist, and this safe working load shall not be exceeded.

(b) The supporting structure to which the hoist is attached shall have a safe working load equal to that of the hoist.

(c) The support shall be arranged so as to provide for free movement of the hoist and shall not restrict the hoist from lining itself up with the load.

(d) The hoist shall be installed only in locations that will permit the operator to stand clear of the load at all times.

(e) Air hoists shall be connected to an air supply of sufficient capacity and pressure to safely operate the hoist. All air hoses supplying air shall be positively connected to prevent their becoming disconnected during use.

(f) All overhead hoists in use shall meet the applicable requirements for construction, design, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

(2) Specific requirements. (Reserved.)

[Order 74-26, § 296-155-540, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-545 Conveyors. (1) All conveyors in use shall meet the applicable requirements for design, construction, inspection, testing, maintenance, and operation, as prescribed in ANSI B20.1-1976, Safety Code for Conveyors, Cableways, and Related Equipment.**

(2) Starting precautions.

(a) When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor.

(b) When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.

(c) All reasonable precautions shall be taken by the operator prior to starting a conveyor, to assure that no person is in a hazardous location where they may be injured when the conveyor is started.

(3) Riding and walking on conveyors.

(a) Riding on conveyor chains, belt, or bucket elevators shall be prohibited.

(b) Persons shall not be allowed to walk on conveyors except for emergency purposes and then only after the conveyor has been deenergized and the person can do so safely.

(c) Riding of conveyors shall only be permitted on the manlift steps and platforms with handholds attached and other safety factors as specified in chapter 296-96 WAC, Safety regulations and fees for all elevators, dumbwaiters, escalators, and other conveyances.

(4) Stop controls.

(a) Means for stopping the motor or engine of a conveyor shall be provided at the operator's station.

(b) If the operator's station is at a remote point, similar provisions for stopping the motor or engine shall be provided at the motor or engine location.

(5) Emergency controls. Emergency stop switches shall be arranged so that the conveyor cannot be started again until the actuating stop switch has been reset to running or "on" position.

(6) Screw type conveyors. Screw or auger type conveyors shall be guarded to prevent employee contact with turning flights.

(7) Overhead conveyors.

(a) Where a conveyor passes over work areas, aisles, or thoroughfares, guards shall be provided to protect persons required to work below the conveyors.

(b) Where a conveyor crosses over an aisle or passageway, it shall be conspicuously marked by suitable signs, as required by Part E of this chapter.

(c) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain. If the strands are over a passageway, a means shall be provided to catch and support the ends of the chain in the event of a break.

(8) Emergency stop.

(a) Conveyors shall be provided with an emergency stopping device (panic-type) which can be reached from the conveyor.

(b) The emergency stopping device shall be located near the material entrance and shall stop the conveyor a sufficient distance away from the hazard to prevent injury.

(c) Where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance who is located or restrained where they cannot possibly fall onto the conveyor an emergency stopping device is not mandatory.

(9) Conveyor lockout.

(a) Conveyors shall be locked out with a padlock at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(b) Tags or push-button stops are not acceptable.

(10) Where conveyors are in excess of seven feet in height, means shall be provided to safely permit essential inspection and maintenance operations.

(11) Conveyor repair.

(a) Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(b) Replacement parts shall be equal to or exceed the manufacturer's specifications.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-05-027, § 296-155-545, filed 2/7/06, effective 4/1/06. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-545, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-545, filed 1/21/86; Order 74-26, § 296-155-545, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-550 Aerial cableways.** (1) Cableways shall be designed to withstand the maximum required load with a safety factor of five (5) on all its parts.

(2) Safety stay lines shall be installed at anchor ends and equal in strength to the cableway.

(3) Where towers are required they shall be securely guyed or constructed to carry the maximum sustained load.

(4) Towers shall be provided with ladderways to facilitate safe access for repairs and inspections.

(5) Towers shall have sufficient elevation to provide substantial clearance for cableway and loads carried over all contemplated work.

(6) Running lines and sheaves, where accessible, shall be guarded.

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(7) The carrier, carrier sheaves, bearings, bucket latch and all working parts shall be lubricated and visually inspected daily.

(8) All the wire ropes shall be kept lubricated with proper lubricant.

(9) Daily visual inspection shall be made of the button line, especially at the buttons where abrasion is caused by the carrier rebound. Rubber and steel ferrule shock absorbers shall be placed at each end of buttons.

(10) All loading, unloading and working stations shall be adequately lighted for night operation. Clearance lights shall be installed on all high points under cableway.

[Order 74-26, § 296-155-550, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-555 Gin poles.** (1) Gin poles shall be properly guyed according to the type used.

(2) Anchors may be of "dead men" or attached to some permanent stable structure.

(3) When the guy lines are anchored to a permanent structure, the anchors shall be distant at least one-half the height of the pole from its base, and when "dead men" are used, they shall be located a distance from the base at least one and one-half times the height of the pole.

(4) The pole shall be securely fastened at the foot to prevent kicking out during operation.

(5) Gin poles shall be of selected timber, sound and free from knots or other injurious defects.

(6) Allowable loads for spruce timbers used as gin poles. The allowable loads and the limiting lengths given are based on the U.S. Forest Products Laboratory Standard Recommendations for Spruce of Common Grade, based on pin connected ends for columns.

Actual	Length in feet	Allowable load capacity in tons
6" x 6".....	10	10.4
6" x 6".....	15	6.6
6" x 6".....	20	3.7
6" x 6".....	25 Max.	2.4
8" x 8".....	20	11.7
8" x 8".....	25	7.5
8" x 8".....	30	5.2
8" x 8".....	33 4" Max.	4.2
10" x 10".....	25	18.2
10" x 10".....	30	12.7
10" x 10".....	35	9.3
10" x 10".....	41 8" Max.	6.6
12" x 12".....	30	26.3
12" x 12".....	35	19.3
12" x 12".....	40	14.8
12" x 12".....	45	11.7
12" x 12".....	50 Max.	9.5

(7) When gin poles are spliced to increase their length, the splicing shall be made with heavy planking at least four feet long securely bolted to all four (4) sides of the pole. If splicing planks are spiked, they shall be securely lashed at the same points.

(8) Additional guy lines shall be attached at the point of splice.

[Order 74-26, § 296-155-555, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-560 Concrete bucket towers.** (1) A concrete bucket tower located inside a structure, and which is three feet or less from any scaffold or the edge of the shaft-way or floor opening in which it is installed, shall be enclosed on all sides with heavy wire netting formed of number sixteen U.S. gauge one and one-half inch mesh. Wood slats placed vertically and spaced not more than one and one-half inches apart may be used instead of the netting.

The enclosure shall extend at least eight feet above such scaffold or floor.

(2) A concrete bucket tower located outside a structure shall be enclosed to a height of eight feet at lower landing with heavy wire netting formed of number sixteen U.S. gauge wire one and one-half inch mesh or other suitable material.

(3) Openings with platforms shall be formed at each floor level, and the runway leading to the tower shall be guarded with standard railings and toeboards.

(4) If the bucket is discharged into a chute, the chute shall be substantially constructed of wood or metal and extend from the tower to the point where the concrete is to be poured, or transferred to vehicles or hoppers, and the chute shall be substantially supported.

(5) The pit shall be drained and deep enough so that any spill from the bucket will fall below the blocking on which the bucket rests while being filled.

(6) Persons shall not be allowed to work in the pit without first resting the bucket on strong timbers supported on two sides of the tower.

(7) The bucket tower shall be securely guyed at two or more elevations as may be necessary.

(8) The guide rails shall be carefully aligned and kept in good condition to prevent the bucket being caught or clogged while being hoisted.

(9) The sheaves over which the cable passes shall be firmly secured to overhead sheave beams and supporting frame work and the sheaves shall be kept lubricated.

(10) The hoisting cable shall be frequently inspected and renewed when broken wires or other defects are discovered.

(11) A platform provided with standard railings and toeboards shall be constructed at the point where the concrete is dumped into the chute. A ladder shall be fastened to one side of the tower to enable a person to reach the platform in safety.

(12) Workers shall be prohibited from riding in or on the bucket.

[Order 74-26, § 296-155-560, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-565 Hoisting engines.** (1) All gearing on hoisting engines shall be enclosed. Steam piping subject to contact shall be insulated and if electrical equipment is used, it shall be grounded.

(2) Hoisting engines shall be of ample capacity and equipped with brakes capable of sustaining one hundred and fifty percent of rated load for stopping and sustaining the maximum load in any position.

(3) Hoisting engines shall be protected against the weather and falling objects by a substantial cover.

(4) All hoisting equipment shall be frequently inspected, and brakes, gears and operating levers kept in working condition.

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(5) Guards shall be provided to prevent persons coming in contact with hoisting cables.

(6) Brake drums shall be kept free of oil or grease.

(7) A positive operated pawl shall be used in addition to the brake to hold the load when it is suspended. Counter weight operated dogs are prohibited.

(8) Hoisting engines shall not be set up in the street when it can be avoided; but, if so located, they shall be completely housed.

(9) Only competent personnel shall operate material hoists.

(10) The operator shall not lift a load when a person is on the hoist, and all towers shall be posted to that effect, except as provided in other sections of this part.

(11) The operator shall be notified when any person goes up the tower ladder, or before any work is done on any part of the tower, overhead work, hoist or in the pit.

(12) The operator shall make daily inspections of all equipment before starting operations.

(13) When the hoisting engine is located close to the building operation, it shall be covered with a strong plank roof covering to protect the operator from falling objects.

(14) Exhaust steam pipes shall discharge overhead so as not to obstruct the view of the operator or scald persons.

(15) In the operation of hoists, the operator shall always give a warning sign or signal before starting.

(16) When hoisting machinery is set on an elevated platform such platform shall be of substantial construction and standard guard rails and toeboards shall be provided along all open sides of the platform.

(17) Material hoists of more than one drum capacity shall be equipped with brake controls.

(18) A safety strap shall be provided on the foot block of all hoists.

(19) When electric motors are used for hoisting equipment, they shall be operated only by qualified personnel.

(a) Installations shall be made in accordance with provisions of local and national electrical safety codes, and shall be made by experienced workers only.

(b) Inclosed switches and fuses shall always be used.

(c) Switchboards shall be screened, and a sign placed warning unauthorized persons to keep clear.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-565, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-565, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-570 Rigging—Wire rope.** (1) Whenever used in connection with work, employment, occupations or uses to which these standards are applicable, wire rope shall not be subjected to loads in excess of one-fifth the breaking load as given in the schedule of the cable manufacturer.

(2) Any wire rope showing 10% of its wires broken in a three foot length shall not be used. When cables deteriorate through rusting, wear, undue strain or other conditions to the extent of 15% of their original strength, use of cable shall be discontinued.

(3) Wire rope shall be frequently inspected for wear and other defects which may reduce the strength below the point of safe operation.

(2007 Ed.)

(4) If wire rope is received in a coil it shall be rolled out, on a surface free from grit, like a hoop and straightened out before being put on the sheaves. If it is received on a reel, the reel shall be mounted on a spindle or turntable and the rope then unwound.

(5) Wire rope shall be lubricated. A lubricant recommended by a wire rope manufacturer shall be used.

(6) Wire rope shall be securely fastened to drums by zinc plugs or suitable clamps, and at least two full turns of the rope shall remain on the winding drum.

(7) Wire rope shall be wound evenly on the drum and not allowed to lap one layer on another in an irregular fashion.

(8) Care shall be taken to prevent friction of wire ropes with other objects which could cause chafing or breaking of wires.

(9) In attaching U-type cable clamps, the U shall always be placed over the short end of the cable.

(10) The clamp nuts shall be tightened up frequently during the operation to prevent slipping.

(11) Thimbles shall be used in cable eyes whenever practicable.

(12) Fair leads shall be used ahead of cable drums, whenever practicable, and the fleet angle kept as flat as possible to promote proper spooling.

(13) All running lines of hoisting equipment, located within seven (7) feet of the ground or working level shall be boxed, railed off or otherwise guarded, or the operating area restricted.

(14) Wire rope which has been welded or been subject to welding of any kind shall not be used.

(15) No open hook shall be used to hoist a bucket, cage, spreader, or skip, nor in any circumstances where the dislodgement of the hook could cause a risk of injury to workers. A safety-hook, mousing, or shackle shall be employed in such circumstances.

(16) When shackles are used, shackle pins shall be secured to prevent accidental withdrawal.

(17) Where a wedge socket connector is used as a wire rope terminal, a single wire rope clip shall be installed in accordance with WAC 296-155-330 (3)(g).

(18) The wire rope shall not be burned off with heat. This may weld the ends of the wires and strands together.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-570, filed 1/21/86; Order 74-26, § 296-155-570, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59901 Table 1.**

**TABLE 1**  
STANDARD 6 x 7 WIRE ROPE<sup>1</sup>  
Breaking Strength in  
Tons of 2,000 Pounds

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
1/4	0.094	2.64	2.30	3.10
5/16	.15	4.10	3.56	3.10
3/8	.21	5.86	5.10	4.43
7/16	.29	7.93	6.90	6.00
1/2	.38	10.3	8.96	7.79
9/16	.48	13.0	11.3	9.82
5/8	.59	15.9	13.9	12.0

(2007 Ed.)

**TABLE 1**  
STANDARD 6 x 7 WIRE ROPE<sup>1</sup>  
Breaking Strength in  
Tons of 2,000 Pounds

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
3/4	.84	22.7	19.8	17.2
7/8	1.15	30.7	26.7	23.2
1	1.50	39.7	34.5	30.0
1-1/8	1.90	49.8	43.3	37.7
1-1/4	2.34	61.0	53.0	46.1
1-3/8	2.84	73.1	63.6	55.3
1-1/2	3.38	86.2	75.0	65.2

<sup>1</sup>For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.  
[Order 74-26, § 296-155-580 (part), Table 1 (codified as WAC 296-155-59901), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59902 Table 2.**

**TABLE 2**  
STANDARD 6 x 19 WIRE ROPE<sup>1</sup>  
Breaking Strength in  
Tons of 2,000 Pounds

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
1/4	0.10	2.74	2.39	2.07
5/16	.16	4.26	3.71	3.22
3/8	.23	6.10	5.31	4.62
7/16	.31	8.27	7.19	6.25
1/2	.40	10.7	9.35	8.13
9/16	.51	13.5	11.8	10.2
5/8	.63	16.7	14.5	12.6
3/4	.90	23.8	20.7	18.0
7/8	1.23	32.2	28.0	24.3
1	1.60	41.8	36.4	31.6
1 - 1/8	2.03	52.6	45.7	39.8
1 - 1/4	2.50	64.6	56.2	48.8
1 - 3/8	3.03	77.7	67.5	58.8
1 - 1/2	3.60	92.0	80.0	69.6
1 - 5/8	4.23	107.0	93.4	81.2
1 - 3/4	4.90	124.0	108.0	93.6
1 - 7/8	5.63	141.0	123.0	107.0
2	6.40	160.0	139.0	121.0
2 - 1/8	7.23	179.0	156.0	...
2 - 1/4	8.10	200.0	174.0	...
2 - 1/2	10.0	244.0	212.0	...
2 - 3/4	12.10	292.0	254.0	...

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 2 (codified as WAC 296-155-59902), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59903 Table 3.**

**TABLE 3**  
STANDARD 8 x 19 WIRE ROPE<sup>1</sup>  
Breaking Strength in  
Tons of 2,000 Pounds

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
1/4	0.09	2.35	2.04
5/16	.14	3.65	3.18
3/8	.20	5.24	4.55

[Title 296 WAC—p. 2159]

TABLE 3

STANDARD 8 x 19 WIRE ROPE<sup>1</sup>

7/16	.28	7.09	6.17
1/2	.36	9.23	8.02
9/16	.46	11.6	10.1
5/8	.57	14.3	12.4
3/4	.82	20.5	17.8
7/8	1.11	27.7	24.1
1	1.45	36.0	31.3
1 - 1/8	1.84	45.3	39.4
1 - 1/4	2.27	55.7	48.4
1 - 3/8	2.74	67.1	58.3
1 - 1/2	3.26	79.4	69.1

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths.  
For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 3 (codified as WAC 296-155-59903), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59904 Table 4.

TABLE 4

STANDARD 6 x 37 WIRE ROPE<sup>1</sup>

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
1/4	0.10	2.59	2.25
5/16	.16	4.03	3.50
3/8	.22	5.77	5.02
7/16	.30	7.82	6.80
1/2	.39	10.2	8.85
9/16	.49	12.9	11.2
5/8	.61	15.8	13.7
3/4	.87	22.6	19.6
7/8	1.19	30.6	26.6
1	1.55	39.8	34.6
1 - 1/8	1.96	50.1	43.5
1 - 1/4	2.42	61.5	53.5
1 - 3/8	2.93	74.1	64.5
1 - 1/2	3.49	87.9	76.4
1 - 5/8	4.09	103.0	89.3
1 - 3/4	4.75	119.0	103.0
1 - 7/8	5.45	136.0	118.0
2	6.20	154.0	134.0
2 - 1/8	7.00	173.0	150.0
2 - 1/4	7.85	193.0	168.0
2 - 1/2	9.69	236.0	205.0
2 - 3/4	11.72	284.0	247.0
3	13.95	335.0	291.0
3 - 1/4	16.37	390.0	339.0
3 - 1/2	19.40	449.0	390.0

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths.  
For these ropes when galvanized, deduct 10% from the above strengths.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-59904, filed 11/22/91, effective 12/24/91; Order 74-26, § 296-155-580 (part), Table 4 (codified as WAC 296-155-59904), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59905 Table 5.

TABLE 5

STANDARD 6 x 19 ELEVATOR ROPE

DIAMETER	Approximate Weight Per Foot	BREAKING STRENGTH		
		Iron	Traction Steel	High- Rise Traction Steel
1/4	0.05	1,000	...	...
1/4	.09	1,800	3,600	...
5/16	.14	2,900	5,600	...
3/8	.20	4,200	8,200	...
7/16	.28	5,600	11,000	...
1/2	.36	7,200	14,500	...
9/16	.46	9,200	18,500	...
5/8	.57	11,200	23,000	...
11/16	.69	...	27,000	30,000
3/4	.82	16,000	32,000	...
13/16	.96	...	37,000	46,000
7/8	1.11	21,400	42,000	...
15/16	1.27	...	48,000	60,000
1	1.45	28,000	54,000	...
1 - 1/16	1.64	...	61,000	...

TABLE 5

STANDARD 6 x 19 ELEVATOR ROPE

Inches	Pounds	Pounds	Pounds	Pounds
3/16	0.06	1,300	...	...
1/4	.10	2,200	3,600	...
5/16	.16	3,200	5,600	...
3/8	.23	5,000	8,200	...
7/16	.31	6,400	11,000	...
1/2	.40	8,400	14,500	...
9/16	.51	10,600	18,500	...
5/8	.63	12,800	23,000	...
11/16	.76	...	27,000	30,000
3/4	.90	18,200	32,000	...
13/16	1.06	...	37,000	46,000
7/8	1.23	24,800	42,000	...
15/16	1.41	...	48,000	60,000
1	1.60	32,000	54,000	...
1 - 1/16	1.81	...	61,000	...

[Order 74-26, § 296-155-580 (part), Table 5 (codified as WAC 296-155-59905), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59906 Table 6.

TABLE 6

STANDARD 8 x 19 ELEVATOR ROPE

DIAMETER Inches	Approximate Weight Per Foot Pounds	BREAKING STRENGTH		
		Iron Pounds	Traction Steel Pounds	High-Rise Traction Steel Pounds
3/16	0.05	1,000	...	...
1/4	.09	1,800	3,600	...
5/16	.14	2,900	5,600	...
3/8	.20	4,200	8,200	...
7/16	.28	5,600	11,000	...
1/2	.36	7,200	14,500	...
9/16	.46	9,200	18,500	...
5/8	.57	11,200	23,000	...
11/16	.69	...	27,000	30,000
3/4	.82	16,000	32,000	...
13/16	.96	...	37,000	46,000
7/8	1.11	21,400	42,000	...
15/16	1.27	...	48,000	60,000
1	1.45	28,000	54,000	...
1 - 1/16	1.64	...	61,000	...

[Order 74-26, § 296-155-580 (part), Table 6 (codified as WAC 296-155-59906), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59907 Table 7.

TABLE 7

STANDARD 5 x 19 MARLINE CLAD ROPE<sup>1</sup>

DIAMETER		Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
Before Serving Inches	After Serving Inches		Plow Steel	Mild Plow Steel
1/4	9/16	0.21	2.17	1.89
5/16	5/8	.28	3.37	2.93
3/8	11/16	.36	4.82	4.20
7/16	3/4	.42	6.53	5.68
1/2	13/16	.51	8.50	7.39
9/16	7/8	.62	10.7	9.31
5/8	1	.81	13.2	11.4
3/4	1 - 1/8	1.10	18.8	16.4
7/8	1 - 1/4	1.70	25.5	22.1
1	1 - 3/8	1.32	33.7	28.7
1 - 1/8	1 - 1/2	2.12	41.6	36.2
1 - 1/4	1 - 5/8	2.58	51.1	44.4
1 - 3/8	1 - 3/4	3.14	61.4	53.4
1 - 1/2	1 - 7/8	3.69	...	...
1 - 5/8	2	4.29	...	...
1 - 3/4	2 - 1/8	5.00	...	...

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths.

For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 7 (codified as WAC 296-155-59907), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59908 Table 8.**

**TABLE 8**  
STANDARD 18 x 7 NONROTATING ROPE

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
3/8	0.24	5.59	4.86
7/16	.33	7.58	6.59
1/2	.43	9.85	8.57
9/16	.55	12.4	10.8
5/8	.68	15.3	13.3
3/4	.97	21.8	19.0
7/8	1.32	29.5	25.7
1	1.73	38.3	33.3
1-1/8	2.19	48.2	41.9
1-1/4	2.70	59.2	51.5
1-3/8	3.27	71.3	62.0
1-1/2	3.89	84.4	73.4
1-5/8	4.57	98.4	85.6
1-3/4	5.30	114.0	98.8

[Order 74-26, § 296-155-580 (part), Table 8 (codified as WAC 296-155-59908), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59909 Table 9.**

**TABLE 9**  
STANDARD 6 x 12 GALVANIZED  
RUNNING ROPE AND HAWSERS

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds		
		Galvanized Improved Plow Steel	Galvanized Plow Steel	Galvanized Iron
5/16	0.10	2.34	2.04	0.905
3/8	.15	3.36	2.92	1.30
7/16	.20	4.55	3.95	1.76
1/2	.26	5.91	5.14	2.28
9/16	.33	7.45	6.48	2.88
5/8	.41	9.16	7.97	3.54
3/4	.59	13.1	11.4	5.06
13/16	.69	15.3	13.3	5.92
7/8	.80	17.7	15.4	6.85
1	1.05	23.0	20.0	8.89
1- 1/16	1.19	25.9	22.5	10.0
1- 1/8	1.33	29.0	25.2	...
1- 3/16	1.48	32.2	28.0	...
1- 1/4	1.64	35.6	30.9	...
1- 3/8	1.99	42.8	37.2	...
1- 7/16	2.17	46.7	40.6	...
1- 1/2	2.36	50.7	44.1	...
1- 5/8	2.77	59.2	51.4	...
1- 11/16	2.99	63.6	55.3	...
1- 3/4	3.22	68.3	59.4	...
1- 15/16	3.45	78.0	63.5	...
1- 15/16	3.94	83.0	72.2	...
2	4.20	88.2	76.7	...
2- 1/16	4.47	93.6	81.4	...

[Order 74-26, § 296-155-580 (part), Table 9 (codified as WAC 296-155-59909), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59910 Table 10.**

**TABLE 10**  
STANDARD 6 x 25 GALVANIZED STEEL  
MOORING LINES AND HAWSERS

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Galvanized Improved Plow Steel	Galvanized Plow Steel
3/8	0.194	4.77	4.14
1/2	.35	8.40	7.30
5/8	.54	13.0	11.3
3/4	.78	18.6	16.2
13/16	.91	21.8	19.0
7/8	1.06	25.2	21.9
1	1.38	32.8	28.5
1- 1/16	1.56	36.9	32.1
1- 1/8	1.75	41.2	35.9
1- 3/16	1.95	45.9	39.9
1- 1/4	2.16	50.7	44.1
1- 3/8	2.61	61.0	53.0
1- 7/16	2.85	66.5	57.9
1- 1/2	3.11	72.3	62.9
1- 5/8	3.64	84.5	73.4
1- 11/16	3.93	90.9	79.0
1- 3/4	4.23	97.5	84.8
1- 13/16	4.53	104.0	90.8
1- 15/16	5.18	119.0	103.0
2	5.52	126.0	110.0
2- 1/16	5.87	134.0	116.0

[Order 74-26, § 296-155-580 (part), Table 10 (codified as WAC 296-155-59910), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59911 Table 11.**

**TABLE 11**  
STANDARD 6 x 37 GALVANIZED STEEL HAWSERS

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
3/4	0.87	21.0	18.2
13/16	1.02	24.5	21.3
7/8	1.19	28.4	24.7
1	1.55	36.9	32.1
1- 1/16	1.75	41.6	36.1
1- 1/8	1.96	46.5	40.4
1- 3/16	2.19	51.7	44.9
1- 1/4	2.42	57.1	49.7
1- 3/8	22.93	68.8	59.8
1- 7/16	3.20	75.0	65.3
1- 1/2	3.49	81.5	70.9
1- 5/8	4.09	95.3	82.9
1- 11/16	4.41	103.0	89.2
1- 3/4	4.75	110.0	95.7
1- 13/16	5.09	118.0	102.0
1- 15/16	5.82	134.0	117.0
2	6.20	143.0	124.0
2- 1/16	6.59	151.0	132.0
2- 1/8	7.00	160.0	139.0
2- 1/4	7.85	179.0	156.0
2- 5/16	8.29	189.0	164.0
2- 3/8	8.74	199.0	173.0

[Order 74-26, § 296-155-580 (part), Table 11 (codified as WAC 296-155-59911), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59912 Table 12.**

**TABLE 12**  
STANDARD 6 x 25 TYPE "B" FLATTENED  
STRAND WIRE ROPE<sup>1</sup>

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
3/8	0.25	6.71	...
1/2	.45	11.8	8.94
9/16	.57	14.9	11.2
5/8	.70	18.3	13.9
3/4	1.01	26.2	19.8
7/8	1.39	35.4	26.8
1	1.80	46.0	34.8
1 - 1/8	2.28	57.9	43.8
1 - 1/4	2.81	71.0	53.7
1 - 3/8	3.40	85.5	...
1 - 1/2	4.05	101.0	...
1 - 5/8	4.75	118.0	...
1 - 3/4	5.51	136.0	...
2	7.20	176.0	...
2 - 1/4	9.10	220.0	...
2 - 1/2	11.20	269.0	...
2 - 3/4	13.60	321.0	...

<sup>1</sup> For these ropes when galvanized, deduct 10 percent from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 12 (codified as WAC 296-155-59912), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59913 Table 13.**

**TABLE 13**  
STANDARD 6 x 30 TYPE "G"  
FLATTENED STRAND WIRE ROPE<sup>1</sup>

DIAMETER Inches	Approximate Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
5/8	0.70	18.3	13.9
3/4	1.01	26.2	19.8
7/8	1.39	35.4	26.8
1	1.80	46.0	34.8
1- 1/8	2.28	57.9	43.8
1- 1/4	2.81	71.0	53.7
1- 3/8	3.40	85.5	...
1- 1/2	4.05	101.0	...
1- 5/8	4.75	118.0	...
1- 3/4	5.51	136.0	...
2	7.20	176.0	...
2- 1/4	9.10	220.0	...
2- 1/2	11.20	269.0	...
2- 3/4	13.60	321.0	...

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to above strengths.

[Order 74-26, § 296-155-580 (part), Table 13 (codified as WAC 296-155-59913), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59914 Table 14.**

**TABLE 14**  
STANDARD 6 x 8 TYPE "D"  
FLATTENED STRAND WIRE ROPE

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
1/2	0.45	11.1	8.37
5/8	.70	17.1	12.9
3/4	1.01	24.4	18.5
7/8	1.39	33.0	24.9

**TABLE 14**  
STANDARD 6 x 8 TYPE "D"  
FLATTENED STRAND WIRE ROPE

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
1	1.80	42.7	32.3
1 - 1/8	2.28	53.5	40.5
1 - 1/4	2.81	65.5	49.5
1 - 3/8	3.40	78.6	59.4
1 - 1/2	4.05	92.7	70.1

[Order 74-26, § 296-155-580 (part), Table 14 (codified as WAC 296-155-59914), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59915 Table 15.**

**TABLE 15**  
STANDARD 6 x 6 x 7 TILLER ROPE<sup>1</sup>

DIAMETER Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
		Plow Steel	Iron
1/4	0.07	1.31	0.584
5/16	.11	2.05	.908
3/8	.16	2.93	1.30
7/16	.21	3.98	1.77
1/2	.28	5.18	2.30
9/16	.35	6.53	2.90
5/8	.43	8.04	3.57

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to above strengths.

[Order 74-26, § 296-155-580 (part), Table 15 (codified as WAC 296-155-59915), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59916 Table 16.**

**TABLE 16**  
STANDARD 9 x 4 GALVANIZED MAST ARM ROPE

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength In Pounds
1/4	0.070	1,100
5/16	.107	1,530
3/8	.158	2,200

[Order 74-26, § 296-155-580 (part), Table 16 (codified as WAC 296-155-59916), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59917 Table 17.**

**TABLE 17**  
STANDARD FLAT ROPE

Width and Thickness Inches	Number of Ropes	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
			Plow Steel	Mild Plow Steel
1/4 x 1-1/2	7	0.69	16.8	14.6
1/4 x 2	9	.88	21.7	18.8
1/4 x 2-1/2	11	1.15	26.5	23.0
1/4 x 3	13	1.34	31.3	27.2
5/16 x 1-1/2	5	.77	18.5	16.0
5/16 x 2	7	1.05	25.8	22.4
5/16 x 2-1/2	9	1.33	33.2	28.8
5/16 x 3	11	1.61	40.5	35.3
5/16 x 3-1/2	13	1.89	47.9	41.7
5/16 x 4	15	2.17	55.3	48.1
3/8 x 2	6	1.25	31.4	27.3

**TABLE 17**  
STANDARD FLAT ROPE

Width and Thickness Inches	Number of Ropes	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds	
			Plow Steel	Mild Plow Steel
3/8 x 2-1/2	8	1.64	41.8	36.4
3/8 x 3	9	1.84	47.1	40.9
3/8 x 3-1/2	11	2.23	57.5	50.0
3/8 x 4	12	2.44	62.7	54.6
3/8 x 4-1/2	14	2.83	73.2	63.7
3/8 x 5	15	3.03	78.4	68.2
3/8 x 5-1/2	17	3.42	88.9	77.3
3/8 x 6	18	3.63	94.1	81.9
1/2 x 2-1/2	6	2.13	54.5	47.4
1/2 x 3	7	2.47	63.6	55.4
1/2 x 3-1/2	8	2.82	72.7	63.3
1/2 x 4	9	3.16	81.8	71.2
1/2 x 4-1/2	10	3.82	90.9	79.1
1/2 x 5	12	4.16	109.0	94.9
1/2 x 5-1/2	13	4.50	118.0	103.0
1/2 x 6	14	4.85	127.0	111.0
1/2 x 7	16	5.85	145.0	126.0
5/8 x 3-1/2	6	3.40	85.8	74.6
5/8 x 4	7	3.95	100.0	87.1
5/8 x 4-1/2	8	4.50	114.0	99.5
5/8 x 5	9	5.04	129.0	112.0
5/8 x 5-1/2	10	5.59	143.0	124.0
5/8 x 6	11	6.14	157.0	137.0
5/8 x 7	13	7.23	186.0	162.0
5/8 x 8	15	8.32	214.0	186.0
3/4 x 5	8	6.50	165.0	143.0
3/4 x 6	9	7.31	185.0	161.0
3/4 x 7	10	8.13	206.0	179.0
3/4 x 8	11	9.70	227.0	197.0
7/8 x 5	7	7.50	190.0	165.0
7/8 x 6	8	8.56	217.0	188.0
7/8 x 7	9	9.63	244.0	212.0
7/8 x 8	10	10.69	271.0	236.0

[Order 74-26, § 296-155-580 (part), Table 17 (codified as WAC 296-155-59917), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59918 Table 18.**

**TABLE 18**  
STANDARD 6 x 12 MARLINE CLAD  
GRAIN-SHOVEL ROPE

Before Serving Inches	After Serving Inches	Approximate Weight Per Foot Pounds	Breaking Strength Tons of 2,000 Pounds
3/4	5/8	0.25	2.50
7/8	3/4	.43	5.50

[Order 74-26, § 296-155-580 (part), Table 18 (codified as WAC 296-155-59918), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59919 Table 19.**

**TABLE 19**  
STANDARD 6 x 7 IRON, BRIGHT, AND  
GALVANIZED SASH CORDS

DIAMETER Inches	BREAKING STRENGTH			
	Approximate Weight Per Foot Pounds	Hard Drawn		Annealed (iron) Bright or Galvanized Pounds
		Bright Pounds	Galvanized Pounds	
1/16	0.006	140	126	77
3/32	.103	315	283	172

(2007 Ed.)

**TABLE 19**  
STANDARD 6 x 7 IRON, BRIGHT, AND  
GALVANIZED SASH CORDS

DIAMETER Inches	BREAKING STRENGTH			
	Approximate Weight Per Foot Pounds	Hard Drawn		Annealed (iron) Bright or Galvanized Pounds
		Bright Pounds	Galvanized Pounds	
1/8	.023	560	504	306
5/32	.038	840	756	478
3/16	.053	1,150	1,035	688
7/32	.072	1,570	1,413	940
1/4	.094	2,040	1,836	1,225

[Order 74-26, § 296-155-580 (part), Table 19 (codified as WAC 296-155-59919), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-59920 Table 20.**

**TABLE 20**  
STANDARD 6 x 7 GALVANIZED  
IRON RIGGING AND GUY ROPE

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds
6 Strands:		
1/4	0.94	0.918
5/16	.15	1.42
3/8	.21	2.04
7/16	.29	2.76
1/2	.38	3.58
9/16	.48	4.51
5/8	.59	5.54
3/4	.84	7.90
13/16	.99	9.23
7/8	1.15	10.7
1	1.50	13.8
1 1/16	1.70	15.5
1 1/8	1.90	17.3
1 3/16	2.12	19.2
1 1/4	2.34	21.2

[Order 74-26, § 296-155-580 (part), Table 20 (codified as WAC 296-155-59920), filed 5/7/74, effective 6/6/74.]

**PART M**  
**MOTOR VEHICLES, MECHANIZED EQUIPMENT,**  
**AND MARINE OPERATIONS**

**WAC 296-155-600 Definitions applicable to this part.**

- (1) "Apron" means the area along the waterfront edge of the pier or wharf.
- (2) "Bearing cap" means:
  - (a) A slab of reinforced concrete or a heavy timber and plank platform covering the top of a group of piles for the purpose of tying them together and transmitting to them as a group the superimposed load.
  - (b) A metal plate placed across the top of a steel tube pile to distribute the load from the steel tube to the concrete.
- (3) "Bearing pile" means a column of wood, metal or concrete or a combination of two or more of these materials, driven, jacked, or sunk with a water jet, into the earth to transmit and distribute loads to strata below the surface.
- (4) "Bulwark" means the side of a ship above the upper deck.
- (5) "Caisson pile" means a concrete pile case in an outer casing consisting of a series of telescoping steel tubes, the top

section being the largest and usually twenty inches or more in diameter.

(6) "Coaming" means the raised frame, as around a hatchway in the deck, to keep out water.

(7) "Composite pile" means a pile which consists of a concrete pile superimposed on a wood pile.

(8) "Jacob's ladder" means a marine ladder of rope or chain with wooden or metal rungs.

(9)(a) A "pedestal type" concrete pile means a cast-in-place pile with an enlarged (mushroom) base or foot.

(b) A "tapered type" concrete pile means a cast-in-place pile cast in a tapered metal shell.

(10) "Precast concrete pile" means a pile which is cast in a form above ground.

(11) "Driving cap" means a device placed on the top of a pile to prevent its breakage or injury during the driving operation.

(12) "H-pile" means a pile formed of a structural steel column of "H" section.

(13) "Pile driver" means a device or piece of equipment used in driving piles.

(14) "Pretest or jack pile" means a steel cylinder pile driven in section beneath an existing building and filled with concrete.

(15) "Rail," for the purpose of WAC 296-155-630, means a light structure serving as a guard at the outer edge of a ship's deck.

(16) "Sheet piling" means a continuous vertical barricade consisting of squared timbers driven edge to edge, either square edged or tongued and grooved, or of a series of interlocking steel shapes, to form a temporary wall about an excavation, and shored and braced as necessary.

(17) "Steel-tube" means a concrete-filled steel cylinder, consisting of an open or closed-end steel tube or cylinder.

(18) "Wood pile" means a pile which is formed from the trunk of a tree or dimension timbers.

[Order 74-26, § 296-155-600, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-605 Equipment.** (1) General requirements.

(a) All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.

(b) All tire servicing of multipiece and single-piece rim wheels are subject to the requirements of WAC 296-155-61701 through 296-155-61713.

(c)(i) Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed required otherwise.

(ii) Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.

(d) The use, care and charging of all batteries shall conform to the requirements of part I of this chapter.

(e) All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine covered by this part.

(f) All equipment covered by this part shall comply with the requirements of WAC 296-155-525 (3)(a) when working or being moved in the vicinity of power lines or energized transmitters.

(g) Where traffic is diverted onto dusty surfaces, good visibility shall be maintained by the suppression of dust, through the periodic application of oil or water to the grade surface, as required.

(h) No equipment, vehicle, tool, or individual shall operate within 10 feet of any power line or electrical distribution equipment except in conformity with the requirements of WAC 296-155-525 (3)(a).

(2) Specific requirements. (Reserved.)

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-605, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-605, filed 1/21/86; Order 74-26, § 296-155-605, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-610 Motor vehicles on construction sites.** (1) Scope. Motor vehicles covered by this section include any vehicles that operate on a construction site. The requirements of this section do not apply to the equipment regulated by WAC 296-155-615, Material handling equipment.

(2) General requirements for motor vehicles.

(a) Braking systems.

• All vehicles must have:

- A service brake system;
- An emergency brake system;

**AND**

– A parking brake system.

• These systems must be maintained in operable condition.

• These systems may use common components.

(b) Before leaving a motor vehicle unattended:

(i) The motor must be stopped.

(ii) The parking brake must be engaged and the wheels turned into curb or berm when parked on an incline.

(iii) If parking on an incline and there is no curb or berm, the wheels must be chocked or otherwise secured.

(c) Lighting systems. All vehicles, or combination of vehicles, must have brake lights in operable condition, regardless of light conditions.

• Employers must meet the requirements in Table 1 below.

Table 1

If:	Then:
Visibility conditions warrant additional light.	All vehicles, or combinations of vehicles, in use must be equipped with: <ul style="list-style-type: none"> <li>• At least two headlights in operable condition;</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>• At least two taillights in operable condition.</li> </ul>

(d) All vehicles must be equipped with an operable audible warning device (horn) at the operator's station.

(e) Operating vehicles, other than passenger cars and pickups, with an obstructed view to the rear. Employers must prohibit the use of any motor vehicle equipment that has an obstructed view to the rear unless the vehicle meets one of the following:

- Has an operable automatic reverse signal alarm audible above the surrounding noise level and audible no less than fifteen feet from the rear of the vehicle;

**OR**

- Is backed up when an observer signals that it is safe to do so.

**Reference:** For requirements on operating dump trucks in reverse, see (f) of this subsection. Operating dump trucks in reverse.

**Note:**

- If the surrounding noise level is so loud that reverse signal alarms are not effective, then an observer must be used.
- An observer can be any individual at the construction site, except a person performing the duties of a flagger. The observer must:

- Be in the direct line-of-sight or able to communicate with the driver.
  - Be able to see the entire backing zone.
  - Continue to provide direction to the driver until:
    - The driver reaches the destination and stops;
- OR**
- There are no longer employees in the backing zone and it is reasonable to expect that no employee(s) will enter the backing zone.

(f) Operating dump trucks in reverse.

(i) You must make sure the dump truck has an operable automatic reverse signal alarm:

- Audible above the surrounding noise level;

**AND**

- Audible no less than fifteen feet from the rear of the vehicle.

(ii) Before backing a dump truck the driver must determine that no one is currently in the backing zone and it is reasonable to expect that no employee(s) will enter the backing zone while operating the dump truck in reverse.

If employee(s) are in the backing zone or it is reasonable to expect that an employee(s) will enter the backing zone, you must make sure the truck is backed up only when:

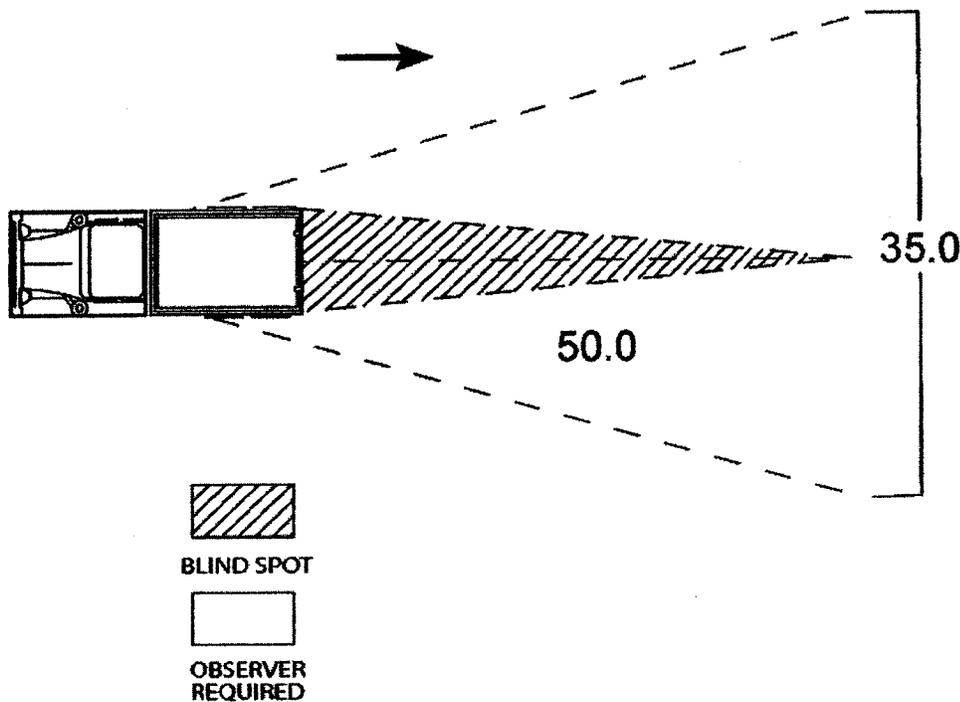
- An observer signals that it is safe to back;

**OR**

- An operable mechanical device that provides the driver a full view behind the dump truck is used, such as a video camera.

**Note:** The following diagram defines the backing zone. Distances are reported in feet.

**DUMP TRUCK BACKING**



**Exemption:**

- Employees are considered protected when they are on the opposite side of a fixed barrier such as:
  - A jersey barrier;
  - Heavy equipment (such as a paving machine);

**OR**

- A six-inch concrete curb.

**Note:** The term "dump trucks" includes both belly and rear dump trucks with a minimum payload of four yards.

- (g) Windshields.
  - All vehicles with cabs must be equipped with:
    - Windshields;
    - Powered wipers; and
    - Rear view mirrors.
  - Cracked and broken glass must be replaced.
  - Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields must be equipped with operable defogging or defrosting devices.

(h) Haulage vehicles. Employers must meet the requirement in Table 2 below.

**Table 2**

If:	Then:
Any haulage vehicles payload is filled by: <ul style="list-style-type: none"> <li>• Cranes;</li> <li>• Power shovels;</li> <li>• Loaders;</li> <li><b>OR</b></li> <li>• Similar equipment.</li> </ul>	You must have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

- (i) Securing material and employees.
  - Tools and material must be secured to prevent movement when transported in the same compartment as employees.
  - Vehicles used to transport employees must have seats firmly secured and adequate for the number of employees to be carried.
  - Seat belts and anchorages meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) must be installed in all motor vehicles and used by all occupants of the vehicle.

- (j) Trucks with dump bodies.
  - Trucks with dump bodies or raisable platforms, beds, or boxes must be equipped with positive means of support, permanently attached. This positive means of support must be capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.
  - Operating levers, controlling hoisting or dumping devices on haulage bodies, must be equipped with a latch or other device, such as a detent switch, which will prevent accidental starting or tripping of the mechanism.

- (k) Fenders on motor vehicle equipment.
  - Trip handles for tailgates of dump trucks must be so arranged that, in dumping, the operator will be in the clear.
  - All rubber-tired motor vehicle equipment must be equipped with fenders.
  - Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

- (l) Vehicle safety inspections.
  - All vehicles in use must be checked at the beginning of each shift to make sure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use:
    - Service brakes (including trailer brake connections);
    - Parking system (hand brake);
    - Emergency stopping system (brakes);
    - Tires;

- Horn;
- Steering mechanism;
- Coupling devices;
- Seat belts;
- Operating controls;
- AND**
- Safety devices.
- These requirements also apply where such equipment is necessary.
  - Lights;
  - Reflectors;
  - Windshield wipers;
  - Defrosters;
  - Fire extinguishers;
  - Steps and handholds for vehicle access;
  - AND**
  - Any other necessary equipment.
  - All defects must be corrected before the vehicle is placed in service.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-24-089, § 296-155-610, filed 12/1/04, effective 1/1/05. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-610, filed 1/21/86; Order 74-26, § 296-155-610, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-615 Material handling equipment. (1)**  
 General requirements for earthmoving equipment.

(a) Scope.  
 These rules apply to the earthmoving equipment. Some examples of earthmoving equipment are:

- Scrapers;
- Loaders;
- Crawler or wheel tractors;
- Bulldozers;
- Off-highway trucks;
- Graders;
- Agricultural and industrial tractors;

**AND**  
 • Similar equipment.

- (b) Seat belts.
  - Seat belts must be provided and used by all operators and passengers on all equipment covered by this section.
  - Seat belts must meet the requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment.

- Seat belts for agricultural and light industrial tractors must meet the seat belt requirements of Society of Automotive Engineers J333a-1970, Operator Protection for Agricultural and Light Industrial Tractors.

**Exemption:** Seat belts are not required for equipment designed only for standup operation.

- Seat belts must not be used on equipment that does not have rollover protective structure (ROPS) or adequate canopy protection in place.

**Exemption:** Mechanics and persons in training may ride on the equipment without a seatbelt if one is not provided.

- (c) Access roadways and grades.
  - Equipment must not be operated on access roadway or grades unless they are constructed and/or maintained to allow for the safe operation of the equipment.

- Every emergency access ramp and berm used by an employer must be constructed to restrain and control run-away vehicles.

(d) Brakes.

Earthmoving equipment must have brakes capable of stopping and holding the equipment fully loaded.

- Equipment mentioned in (a) of this subsection, General requirements for earthmoving equipment, must have brakes meeting the specifications in Society of Automotive Engineers SAE-J237, Loader Dozer-1971, J236, Graders-1971, and J319b, Scrapers-1971.

- Brake systems for self-propelled rubber-tired off-highway equipment manufactured after January 1, 1972, must meet the applicable minimum performance criteria set forth in the following Society of Automotive Engineers Recommended Practices:

Self-propelled scrapers	SAE J319b-1971
Self-propelled graders	SAE J236-1971
Truck and wagons	SAE J166-1971
Front-end loaders and dozers	SAE J237-1971

(e) Fenders.

- If pneumatic-tired earthmoving haulage equipment has a maximum speed that exceeds fifteen miles per hour, then the equipment must be equipped with fenders on all wheels to meet the requirements of Society of Automotive Engineers SAE J321a-1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment.

- An employer may, at any time, seek to show under WAC 296-155-010, Variance and procedure, that the uncovered wheels present no hazard to personnel from flying materials.

**Note:** Examples of pneumatic-tired earthmoving haulage equipment may include:

- Trucks;
- Scrapers;
- Tractors;

**AND**

- Trailing units.

(f) Rollover protective structures (ROPS).

For requirements pertaining to rollover protective structures and overhead protection, see WAC 296-155-950 through 296-155-965.

(g) Audible alarms.

- All bidirectional machines must be equipped with a horn, distinguishable from the surrounding noise level. This horn must be:

- Operated as needed when the machine is moving in either direction;

**AND**

- Maintained in an operative condition.

**Note:** Examples of bidirectional machines include:

- Rollers;
- Compactors;
- Front-end loaders;
- Bulldozers;

**AND**

- Similar equipment.

- Employers must make sure that earthmoving or compacting equipment with an obstructed view to the rear in reverse is not operated unless:

- A reverse signal alarm distinguishable from the surrounding noise level is used;

**OR**

- An observer signals that it is safe to back up.

- If the surrounding noise level is of such amplitude that reverse signal alarms are not effective, then amber strobe lights must be used.

(h) Operators must look in the direction of travel.

The driver must look in the direction of, and keep a clear view of the path of travel, when operating equipment in reverse.

**Exemption:** See (g)(ii) of this subsection, Audible alarms, for requirements pertaining to equipment that has an obstructed view to the rear.

(i) Scissor points.

Scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, must be guarded.

(j) Tractors.

- Tractor motors must be cranked only by operators or other experienced persons.

- Waterproof and comfortable seat cushions must be provided on tractors at all times when working.

- Operator must not leave controls of tractor with master clutch engaged.

(k) Winch lines.

Winch lines must be maintained in good condition and provided with spliced eye, knob or hook in working end, except under conditions where unspliced end is required.

(l) Bulldozers and carry-all gates.

- Repairs on blade or dozer equipment must not be initiated unless the motor has been stopped and dozer blade is resting on the ground or securely blocked. The same applies to carry-all gates.

- Bulldozer blades and carry-all gates must rest on the ground or on blocking when machines are not in operation.

(m) Moving equipment.

Personnel must not get on or off machine while machine is in motion.

(n) Hazardous conditions.

Where excessive dust conditions are created, such areas must be sprinkled with water or an environmentally safe solution to keep dust at a minimum.

**Reference:** When dust presents a hazard, see chapter 296-841 WAC, Respiratory hazards for additional requirements.

(2) Excavating and other equipment.

(a) Tractors covered in subsection (1) of this section must have seat belts as required for the operators when seated in the normal seating arrangement for tractor operation.

(b) For the purposes of this part and of Part L of this chapter, the names and descriptions for measurement of dimensions of machinery and attachments must be as described in Society of Automotive Engineers 1970 Handbook, pages 1088 through 1103.

(c) The safety requirements, ratios, or limitations applicable to machines or attachment usage covered in Power Crane and Shovel Association's Standards No. 1 and No. 2 of 1968, and No. 3 of 1969, must be complied with, and must apply to cranes, machines, and attachments under this part.

(3) Lifting and hauling equipment (other than equipment covered under Part L of this chapter). Industrial trucks (including forklifts) shall meet the requirements of WAC 296-24-230, 296-155-605 and the following:

(a) Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counter-weights are provided by the manufacturer, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.

(b) No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's or professional engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(c) If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.

(d) Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob shall be mounted within the periphery of the wheel.

(e) All high lift rider industrial trucks shall be equipped with overhead guards which meet the configuration and structural requirements as defined in paragraph 502 of American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

(f) All industrial trucks in use shall meet the applicable requirements of design, construction, stability, inspection, testing, maintenance, and operation, as defined in American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

(g) Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.

(h) When a forklift truck is used for elevating workers a platform shall be specifically built for that purpose and shall comply with the following requirements:

(i) The platform shall be securely attached to the forks and shall have standard guardrails and toeboards on all open sides.

(ii) The hydraulic system of the forklift shall be so designed that the lift mechanism will not drop faster than one hundred thirty-five feet per minute in the event of a failure in any part of the system. Forklifts used for elevating platforms shall be identified that they are so designed.

(iii) A safety strap shall be installed on the control lever shall be locked to prevent the boom from tilting.

(iv) An operator shall be at the controls of the forklift equipment while persons are on the platform.

(v) The operator shall be in the normal operating position while raising or lowering the platform.

(vi) The vehicle shall not travel from point to point while workers are on the platform except that inching or maneuvering at very slow speed is permissible.

(vii) The area between workers on the platform and the mast shall be adequately guarded to prevent contact with chains or other shear points.

(viii) All platforms shall be visually inspected daily or before each use by the person in charge of the work being performed, and shall be tested as frequently as is necessary to maintain minimum safety factors.

(ix) Whenever a truck, except for high lift order picker trucks, is equipped with vertical hoisting controls elevatable with the lifting carriage or forks, the following precautions shall be taken for the protection of personnel being elevated.

(A) Provide a platform secured to the lifting carriage and/or forks.

(B) Provide means whereby personnel on the platform can shut off power to the truck.

(C) Provide such protection from falling objects as indicated necessary by the operating conditions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 04-24-089, § 296-155-615, filed 12/1/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-155-615, filed 12/21/99, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-615, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-615, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-615, filed 1/21/86; Order 74-26, § 296-155-615, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-620 Pile driving equipment.** (1) General requirements.

(a) Boilers and piping systems which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Powers Boilers (section I).

(b) All pressure vessels which are a part of or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Pressure Vessels (section VIII).

(c) Overhead protection, which will not obscure the vision of the operator, and which meets the requirements of Part L of this chapter, shall be provided. Protection shall be of 2-inch planking or other solid material of equivalent strength.

(d) Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.

(e) A blocking device, capable of safely supporting the weight of the hammer shall be provided for placement in the leads under the hammer at all times while employees are working under the hammer.

(f) Guards shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.

(g) When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads.

(h) All working equipment shall be visually inspected at the beginning of each shift.

(i) Fixed leads shall be provided with ladder, and adequate rings, or similar attachment points, so that the loft workers may engage their full body harness lanyard to the leads. If the leads are provided with loft platform(s) such platform(s) shall be protected by standard guardrails.

(j) Pile drivers with swinging leads shall have a wire rope safety strap on top end.

(k) Spud bars shall be of hard wood with smooth round handle end for safe handling. Iron shod spud bars are prohibited.

(l) A follower block or driving cap shall be used with a drop hammer on all piling except sheet piling.

(m) Steam hose leading to a steam hammer or jet pipe shall be securely attached to the hammer with an adequate length of at least 1/4-inch diameter chain or cable to prevent

whipping in the event the joint at the hammer is broken. Air hammer hoses shall be provided with the same protection as required for steam lines.

(n) Safety chains, or equivalent means, shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.

(o) Steam line controls shall consist of two shutoff valves, one of which shall be a quick-acting lever type within easy reach of the hammer operator.

(p) Guys, outriggers, thrustouts, or counterbalances shall be provided as necessary to maintain stability of pile driver rigs.

(q) Ladders constructed in compliance with this chapter shall be installed on all pile drivers from the hoist platform to the head block, and in such position that workers using ladders will not come in contact with lines, sheaves, etc.

(r) Drop hammers which have been chipped on the face shall not be used for pile driving.

(s) Groove worn drums or spools shall be replaced or properly repaired to present a smooth working surface.

(t) At least two full wraps of cable shall be maintained on hoisting drums.

(u) Proper racks shall be provided for storage of cross-cut saws.

(v) Every hoisting drum used as a pile driver shall be equipped with manually operated dogs or pawls to hold suspended loads. Foot brakes shall only be used to hold suspended loads until drum dogs are engaged. The dogs shall be visible from the operator's station or be equipped with a positive direct connected telltale which shall be visible to the operator.

(w) No counterweight or spring arrangement on dogs shall be permitted which would allow dog to be automatically disengaged either by relieving the load or rolling the drum.

(x) In every crew there shall be designated signalperson. The driver operator or drum person shall receive signals from no others, except when loftworker is above. The hammer shall not be lowered except on the loftworker's signal.

(y) Spliced hammer lines shall not be used.

(2) Pile driving from barges and floats. Barges or floats supporting pile driving operations shall meet the applicable requirements of WAC 296-155-630.

(3) Pile driving equipment.

(a) Engineers and winchperson shall accept signals only from the designated signalperson.

(b) All employees shall be kept clear when piling is being hoisted into the leads.

(c) When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.

(d) When steel tube piles are being "blown out," employees shall be kept well beyond the range of falling materials.

(e) When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.

(f) When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

(g) Floating equipment such as dredges and pile drivers shall maintain a signal system to shore in the event of an emergency.

(h) The distribution of machinery on floating equipment shall be such that the completed unit floats on an even keel.

(i) Fuel tanks below decks shall be vented to outside of hull and vents shall be equipped with flame arrestors.

(j) All hull compartments shall be ventilated. No person shall work in hull compartments until it is shown the compartments contain no flammable or toxic concentrations.

(k) Light fixtures installed or used within the hull shall be explosion proof.

(l) All floating rigs shall be equipped with ladderways extending from the deck to the waterline where the deck is more than 36 inches above the water. A wire rope shall be hung along both sides of the hull or float and so hung that it shall be at all times near or at the waterline.

(m) Doors of deck houses where deck house sets within 36" of edge of deck and doorways in hull shall be equipped with guard rails or cross chains.

(n) Deck houses shall have a substantial grab rail installed on all sides where such installation will not interfere with operations.

(o) Pile driver and dredge fairlead sheaves, and spudline sheaves shall be guarded to prevent workers or tools being drawn into them.

(p) All work deck shall be kept clear of debris, unnecessary tools and equipment in order to minimize the stumbling hazard. Lines shall be coiled, tools stored and material stacked clear of working spaces.

(q) Night operations shall be adequately lighted for all activity while work is in progress and shall be maintained until workers leave the work area.

(r) Electrical installation and equipment shall be installed and maintained in compliance with the National Electric Code.

(s) All walkways over water and on dredge pontoon discharge pipe lines shall be a minimum of 20" in width with standard handrail along one side on structures and gang planks. Walkways on pontoon lines may be equipped with hand lines in lieu of standard handrail.

(t) Adequate fire extinguishing equipment shall be provided and maintained in a serviceable condition.

(u) Protective equipment shall be used when working with creosote timbers. Protective creams shall be used on exposed skin surfaces and gloves and eye protection worn especially when driving piles.

(v) Pulling piles with hammer or pile line rigged through the head block is prohibited unless driver and rigging are designed to safely withstand the imposed strain.

(w) Truck runways and platforms shall be equipped with a wheel guard on all outside edges. Top of wheel guards shall be a minimum of 10 inches above deck.

(x) Use of foot blocks at base of leads for hammer line or pile line is prohibited.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-620, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-620, filed 1/10/91, effective 2/12/91; Order 76-29, § 296-155-620, filed 9/30/76; Order 74-26, § 296-155-620, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-625 Site clearing.** (1) General.

(a) The word "clearing" means the removal of trees, stumps, logs, brush, debris and rubbish from the surface of the ground in preparation of a site for construction work of any kind. The removal of trees and logs shall be in accordance with the requirements of chapter 296-54 WAC.

(b) All equipment and tools such as axes, sledges, wedges, saws, springboards, etc., shall be maintained in a safe condition and guarded with standard safeguards.

(c) Fallers shall give warning to brushing crews, buckers and other persons in the vicinity where a tree is being felled; taking notice that such persons are not only out of the reach of tree, but also out of danger of possible sidewinders, snags or other trees which may be knocked over by the tree being felled.

(d) Trees must not be felled toward and within range of a traveled road or operational railroad unless a flagger is used to stop all approaching persons, vehicles, or railroad equipment. Flaggers and flagging activities at the site must comply with the requirements of WAC 296-155-305.

(e) Clearing crews shall not be placed immediately below other crews working on hillsides where there is a possible danger of skidding or rolling trees, moving earth or rock.

(f) Pioneer roads on clearing operations shall be constructed to safely accommodate all equipment moved over road.

(g) Hazardous standing and down timber, rocks, etc., shall be moved from upper sides of cuts on side hill operations.

(h) Care shall be exercised in the use of oil for burning brush or timber.

(i) Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably instructed in the first-aid treatment available.

(j) All equipment used in site clearing operations shall be equipped with rollover guards meeting the requirements of this chapter. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:

(i) The overhead covering on this canopy structure shall be of not less than 1/8-inch steel plate or 1/4-inch woven wire mesh with openings no greater than 1 inch, or equivalent.

(ii) The opening in the rear of the canopy structure shall be covered with not less than 1/4-inch woven wire mesh with openings no greater than 1 inch.

(iii) Use of 1/2 inch thick plastic sheets or other thicknesses of plastic panels derived from polycarbonate, acrylic, cellulose acetate butyrate which provides equivalent or better protection against particular hazards involved is acceptable in lieu of 1 or 1 3/4 inch open mesh material.

(A) All panels shall be installed in a manner which can withstand the initial impact, and maintain the protective barrier integrity; and

(B) All panels must be labeled or marked to distinguish between acceptable and inferior materials.

(k) In addition to observance of the general safety and health standards;

(i) The employer shall assume the responsibility of work assignment so that no worker shall be required to work in a position or location so isolated as to not be within ordinary

calling distance of another person who can render assistance in case of emergency. In any operation where cutting, felling trees, loading, or a combination of these duties is carried on, there shall be a minimum crew of two persons who shall work as a team and shall be in visual or voice contact with one another. If one worker at these operations is required to be left alone for a period of time, the worker shall be contacted by another person at reasonable intervals not to exceed fifteen minutes unless such practice can be established to be impractical.

(ii) This does not apply to operators of motor vehicles, watchpersons or certain other jobs which, by their nature, are singular worker assignments. However, a definite procedure for checking the welfare of all workers during working hours shall be instituted and all workers so advised.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, 2000 c 239, and chapter 34.05 RCW. 01-04-015, § 296-155-625, filed 1/26/01, effective 2/28/01. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-625, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-625, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-625, filed 1/21/86; Order 74-26, § 296-155-625, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-630 Marine operations and equipment.** (1) Material handling operations.

Operations fitting the definition of "material handling" shall be performed in conformance with applicable requirements of "Safety and health regulations for longshoring." The term "longshoring operations" means the loading, unloading, moving, or handling of construction materials, equipment and supplies, etc. into, in, on, or out of any vessel, from a fixed structure or shore-to-vessel, vessel-to-shore or fixed structure or vessel-to-vessel.

## (2) Access to barges.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp, meeting the requirements of (a) of this subsection, or a safe walkway, shall be provided.

(c) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(d) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

(e) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial hand rail approximately 33 inches in height, shall be provided between the top of the bulwark and the deck.

(f) Obstructions shall not be laid on or across the gangway.

(g) The means of access shall be adequately illuminated for its full length.

(h) Unless the structure makes it impossible, the means of access shall be so located that the load will not pass over employees.

## (3) Working surfaces of barges.

(a) Employees shall not be permitted to walk along the sides of covered lighters or barges with coamings more than

5 feet high, unless there is a 3-foot clear walkway, or a grab rail, or a taut handline is provided.

(b) Decks and other working surfaces shall be maintained in a safe condition.

(c) Employees shall not be permitted to pass fore and aft, over, or around deckloads, unless there is a safe passage.

(d) Employees shall not be permitted to walk over deckloads from rail to coaming unless there is a safe passage. If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 inches of bulwark, rail, coaming, or other protection exists, all employees shall be provided with a suitable means of protection against falling from the deckload.

(4) First-aid and lifesaving equipment.

(a) Provisions for rendering first aid and medical assistance shall be in accordance with Part B of this Chapter.

(b) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch life ring with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that the employer is working the barge.

(c) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved personal flotation devices such as Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or their equivalent, pursuant to 46 CFR 160 (Coast Guard Lifesaving Equipment Specifications) and 33 CFR 175.23 (Coast Guard table of devices equivalent to personal flotation devices). Ski belt or inflatable type personal flotation devices are specifically prohibited.

(5) Diving operations. (Reserved.)

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-630, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-630, filed 9/30/76; Order 74-26, § 296-155-630, filed 5/7/74, effective 6/6/74.]

## PART N

### EXCAVATION, TRENCHING, AND SHORING

**WAC 296-155-650 Scope, application, and definitions applicable to this part.** (1) Scope and application. This part applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

(2) Definitions applicable to this part.

(a) "Accepted engineering requirements or practices." Those requirements which are compatible with standards of practice required by a registered professional engineer.

(b) "Aluminum hydraulic shoring." A preengineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed, specifically to support the sidewalls of an excavation and prevent cave-ins.

(c) "Bell-bottom pier hole." A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

(d) "Benching (benching system)." A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or

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steps, usually with vertical or near-vertical surfaces between levels.

(e) "Cave-in." The separation of a mass of soil or rock material from the side of an excavation, or loss of soil from under a trench shield or support system, and its sudden movement into the excavation in quantity that it could entrap, bury, injure, or immobilize a person.

(f) "Competent person." One who can identify existing or predictable hazards in the surroundings that are unsanitary, hazardous, or dangerous to employees. Also has authorization or authority by the nature of their position to take prompt corrective measures to eliminate them. The person shall be knowledgeable in the requirements of this part.

(g) "Cross braces." The horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

(h) "Excavation." Any person-made cut, cavity, trench, or depression in the earth's surface, formed by earth removal.

(i) "Faces or sides." The vertical or inclined earth surfaces formed as a result of excavation work.

(j) "Failure." The breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

(k) "Hazardous atmosphere." A atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

(l) "Kickouts." Accidental release or failure of a cross brace.

(m) "Protective system." A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

(n) "Ramp." An inclined walking or working surface that is used to gain access to one point to another, and is constructed from earth or from structural materials such as steel or wood.

(o) "Registered professional engineer." A person who is registered as a professional engineer in the state of Washington. The registered professional engineer shall comply with the Washington state department of licensing requirements, chapter 18.43 RCW.

(p) "Sheeting." The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

(q) "Shield (shield system)." A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with WAC 296-155-657 (3)(c) or (d). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

(r) "Shoring (shoring system)." A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

(s) "Sides." See "faces."

(t) "Sloping (sloping system)." A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

(u) "Stable rock." A natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

(v) "Structural ramp." A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

(w) "Support system." A structure such as underpinning, bracing or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

(x) "Tabulated data." Tables and charts approved by a registered professional engineer and used to design and construct a protective system.

(y) "Trench (trench excavation)." A narrow excavation in relation to its length made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

(z) Trench box. See "shield."

(aa) "Trench shield." See "shield."

(bb) "Uprights." The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

(cc) "Wales." Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-650, filed 7/20/94, effective 9/20/94. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-650, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-650, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-650, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-650, filed 6/17/81; Order 74-26, § 296-155-650, filed 5/7/74, effective 6/6/74.]

### **WAC 296-155-655 General protection requirements.**

(1) Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

(2) Underground installations.

(a) The location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other under-

ground installations that reasonably may be expected to be encountered during excavation work, shall be located prior to opening an excavation.

(b) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to locate the underground utility installation prior to the start of actual excavation.

(c) When excavation operations approach the location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(d) While the excavation is open, underground installations shall be protected, supported, or removed as necessary to safeguard employees.

(3) Access and egress.

(a) Structural ramps.

(i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(b) Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(4) Exposure to vehicular traffic. Employees exposed to vehicular traffic shall be provided with and shall wear high-visibility garments meeting the requirements of WAC 296-155-200, General requirements for personal protective equipment (PPE).

(5) Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with WAC 296-155-610 (2)(g), to provide adequate protection for the operator during loading and unloading operations.

(6) Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(7) Hazardous atmospheres.

(a) Testing and controls. In addition to the requirements set forth in parts B-1, C, and C-1 of this chapter (296-155 WAC) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with chapter 296-842 WAC.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 10 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(b) Emergency rescue equipment.

(i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

Note: See chapter 296-62 WAC, Part M for additional requirements applicable to confined space operations.

(8) Protection from hazards associated with water accumulation.

(a) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

(b) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(c) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drain-

age of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with subdivisions (a) and (b) of this subsection.

(9) Stability of adjacent structures.

(a) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(b) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(c) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(10) Protection of employees from loose rock or soil.

(a) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(b) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(11) Inspections.

(a) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(b) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be

removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(12) Fall protection.

(a) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with chapter 296-155 WAC, Part K shall be provided where walkways are 4 feet or more above lower levels.

(b) Adequate barrier physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be backfilled.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-20-055, § 296-155-655, filed 10/3/05, effective 12/1/05; 05-03-093, § 296-155-655, filed 1/18/05, effective 3/1/05; 04-24-089, § 296-155-655, filed 12/1/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050, 99-17-094, § 296-155-655, filed 8/17/99, effective 12/1/99; 99-10-071, § 296-155-655, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060, 96-24-051, § 296-155-655, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW, 95-10-016, § 296-155-655, filed 4/25/95, effective 10/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060, 92-22-067 (Order 92-06), § 296-155-655, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW, 91-03-044 (Order 90-18), § 296-155-655, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-655, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-13-053 (Order 81-9), § 296-155-655, filed 6/17/81; Order 76-29, § 296-155-655, filed 9/30/76; Order 74-26, § 296-155-655, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-657 Requirements for protective systems.** (1) Protection of employees in excavations.

(a) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with subsections (2) or (3) of this section except when:

(i) Excavations are made entirely in stable rock; or

(ii) Excavations are less than 4 feet (1.22m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

(b) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

(2) Design of sloping and benching systems. The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or employer's designee and shall be in accordance with the requirements of subdivision (a); or, in the alternative, subdivision (b); or, in the alternative, subdivision (c); or, in the alternative, subdivision (d), as follows:

(a) Option 1—Allowable configurations and slopes.

(i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(ii) Slopes specified in item (i) of this subdivision, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this part.

(b) Option 2—Determination of slopes and configurations using Appendices A and B. Maximum allowable slopes, and allowable configurations for sloping and benching sys-

tems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this part.

(c) Option 3—Designs using other tabulated data.

(i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the director upon request.

(d) Option 4—Design by a registered professional engineer.

(i) Sloping and benching systems not utilizing Option 1 or Option 2 or Option 3 under subsection (2) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that were determined to be safe for the particular project;

(B) The configurations that were determined to be safe for the particular project; and

(C) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the director upon request.

(3) Design of support systems, shield systems, and other protective systems. Designs of support systems, shield systems, and other protective systems shall be selected and constructed by the employer or employer's designee and shall be in accordance with the requirements of subdivision (a); or, in the alternative, subdivision (b); or, in the alternative, subdivision (c); or, in the alternative, subdivision (d) as follows:

(a) Option 1—Designs using appendices A, C, and D. Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this part. Designs for aluminum hydraulic shoring shall be in accordance with subdivision (b) of this subsection, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

(b) Option 2—Designs using manufacturer's tabulated data.

(i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

(ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(iii) Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the director upon request.

(c) Option 3—Designs using other tabulated data.

(i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

(B) Identification of the limits of use of the data;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the director upon request.

(d) Option 4—Design by a registered professional engineer.

(i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include the following:

(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(B) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the director upon request.

(4) Materials and equipment.

(a) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(b) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(c) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and

approved by a registered professional engineer before being returned to service.

(5) Installation and removal of support.

(a) General.

(i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

(vi) Backfilling shall progress together with the removal of support systems from excavations.

(b) Additional requirements for support systems for trench excavations.

(i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(6) Sloping and benching systems. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(7) Shield systems.

(a) General.

(i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(b) Additional requirement for shield systems used in trench excavations. Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-657, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-657, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-66103 Reserved.**

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66103, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-66103, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-66105 Reserved.**

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66105, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-66105, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-66109 Reserved.**

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66109, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-66109, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-664 Appendices.**

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-664, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-664, filed 1/10/91, effective 2/12/91.]

**WAC 296-155-66401 Appendix A—Soil classification.** (1) Scope and application.

(a) Scope. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(b) Application. This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in WAC 296-155-657 (2)(b) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C to part N of this chapter, and when aluminum hydraulic shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in WAC 296-155-657(3), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(2) Definitions. The definitions and examples given below are based on, in whole or in part, the following; American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System, The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

(a) Cemented soil. A soil in which the particles are held together by a chemical agent, such as calcium carbonate such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

(b) Cohesive soil. Clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil

does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

(c) Dry soil. Soil that does not exhibit visible signs of moisture content.

(d) Fissured. A soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

(e) Granular soil. Gravel, sand, or silt, (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

(f) Layered system. Two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

(g) Moist soil. A condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

(h) Plastic. A property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

(i) Saturated soil. A soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

(j) Soil classification system. For the purpose of this part, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

(k) Stable rock. Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

(l) Submerged soil. Soil which is underwater or is free seeping.

(m) Type A. Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: Clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. No soil is Type A if:

(i) The soil is fissured; or

(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or

(iii) The soil has been previously disturbed; or

(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H:1V) or greater; or

(v) The material is subject to other factors that would require it to be classified as a less stable material.

(n) Type B.

(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa): or

(ii) Granular cohesionless soils including: Angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.

(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.

(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration: or

(v) Dry rock that is not stable: or

(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than 4 horizontal to 1 vertical (4H.1V), but only if the material would otherwise be classified as Type B.

(o) Type C.

(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less: or

(ii) Granular soils including gravel, sand, and loamy sand: or

(iii) Submerged soil or soil from which water is freely seeping: or

(iv) Submerged rock that is not stable, or

(v) Material in a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H.1V) or steeper.

(p) Unconfined compressive strength. The load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

(q) Wet soil. Soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(3) Requirements.

(a) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in subsection (2) of this section.

(b) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests in subsection (4) of this section or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

(c) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in subsection (4) of this section, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(d) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(e) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a com-

petent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(4) Acceptable visual and manual tests.

(a) Visual tests. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and sides of the open excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(b) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a 2 inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration

test described in American Society for Testing and Materials (ASTM) Standard designation D2488-"Standard Recommended Practice for Description of Soils (Visual—Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be and penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shear vane.

(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately 1 inch thick (2.54 cm) and 6 inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as a unfissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66401, filed 10/30/92, effective 12/8/92.]

**WAC 296-155-66403 Appendix B—Sloping and benching.** (1) Scope and application. This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in WAC 296-155-657 (2)(b).

(2) Definitions.

(a) Actual slope. The slope to which an excavation face is excavated.

(b) Distress. Soil that is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and ravelling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face

of an excavation and trickling or rolling down into the excavation.

(c) Maximum allowable slope. The steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

(3) Requirements.

(a) Soil classification. Soil and rock deposits shall be classified in accordance with appendix A of this Part.

(b) Maximum allowable slope. The maximum allowable slope for a soil or rock deposit shall be determined from Table N-1 of this appendix.

(c) Actual slope.

(i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least 1/2 horizontal to one vertical (1/2H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with WAC 296-155-655(9).

(d) Configurations. Configurations of sloping and benching systems shall be in accordance with Figures N-1 through N-18.

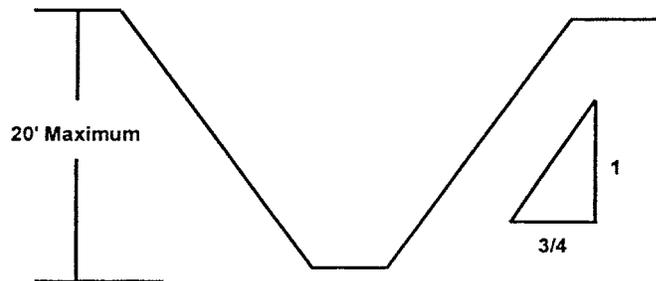
TABLE N-1  
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V) <sup>(1)</sup> FOR EXCAVATION LESS THAN 20 FEET DEEP <sup>(2)</sup>
STABLE ROCK	VERTICAL (90°)
TYPE A	3/4: 1 (53°)
TYPE B	1: 1 (45°)
TYPE C	1 1/2: 1 (34°)

Notes: (1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

(2) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

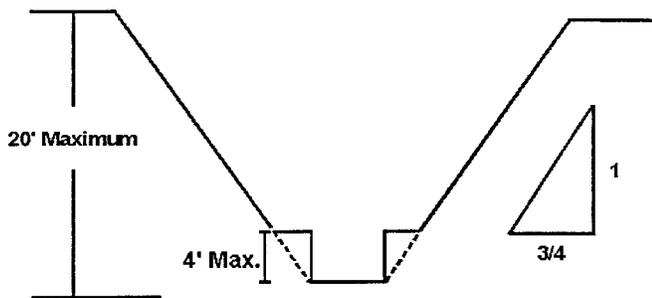
Figure N-1  
Slope Configurations  
for Type A Soil



Simple Slope - General

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.

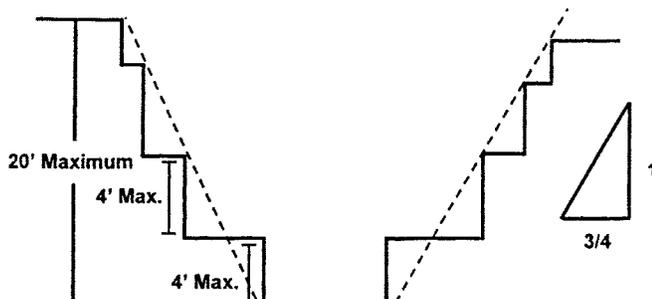
**Figure N-2  
Slope Configurations  
for Type A Soil**



**Simple Bench**

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4:1 and maximum bench dimensions of 4 feet.

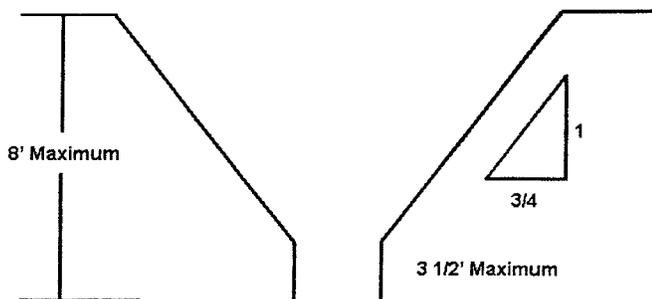
**Figure N-3  
Slope Configurations  
for Type A Soil**



**Multiple Bench**

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4:1 and maximum bench dimensions of 4 feet.

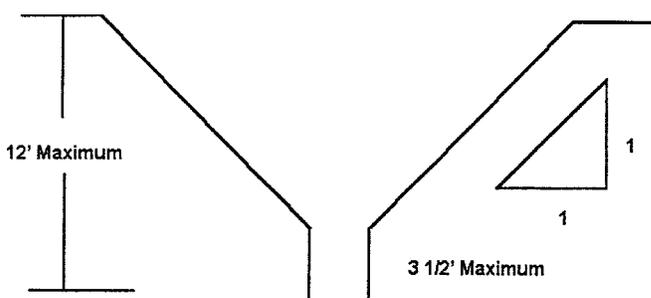
**Figure N-4  
Slope Configurations  
for Type A Soil**



**Unsupported Vertically Sided Lower Portion Maximum 8 Feet in Depth**

All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.

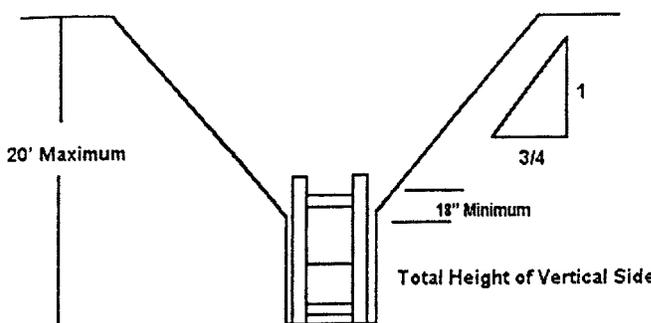
**Figure N-5  
Slope Configurations  
for Type A Soil**



**Unsupported Vertically Sided Lower Portion Maximum 12 Feet in Depth**

All excavations more than 8 feet but not more than 12 feet in depth which have unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and vertical side of 3 1/2 feet.

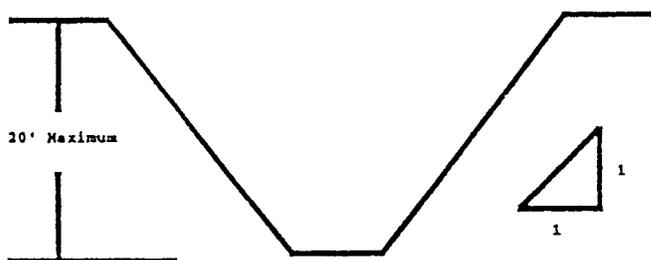
**Figure N-6  
Slope Configurations for Type A Soil  
Support or Shield System**



**Unsupported Vertically Sided Lower Portion Maximum 20 Feet in Depth**

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support shield system must extend at least 18 inches above the top of the vertical side. All other simple slope, compound slope and vertically sided lower portion excavations shall be in accordance with options permitted under WAC 296-155-657(2).

**Figure N-7  
Slope Configurations  
for Type B Soil**

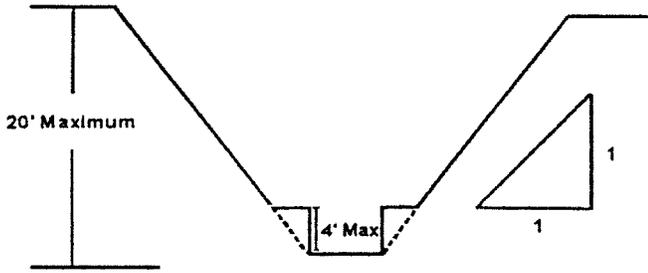


**Simple Slope**

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1

**Figure N-8  
Slope Configurations  
for Type B Soil**

This bench allowed in cohesive soil only.

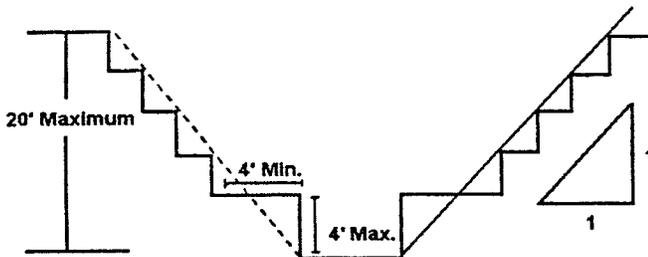


**Single Bench**

All excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions of 4 feet.

**Figure N-9  
Slope Configurations  
for Type B Soil**

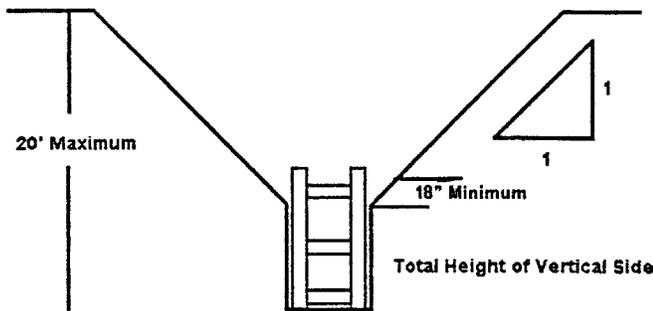
This bench allowed in cohesive soil only.



**Multiple Bench**

All excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions of 4 feet.

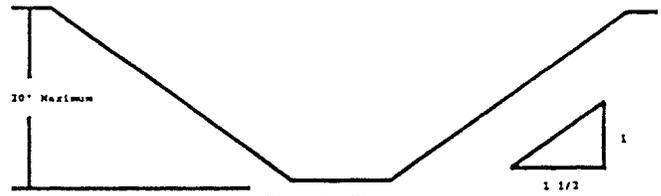
**Figure N-10  
Slope Configurations  
for Type B Soil  
Support or Shield System**



**Vertically Sided Lower Portion**

All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1. All other simple slope, compounded slope and vertically sided lower portion excavations shall be in accordance with options permitted under WAC 296-155-657(2).

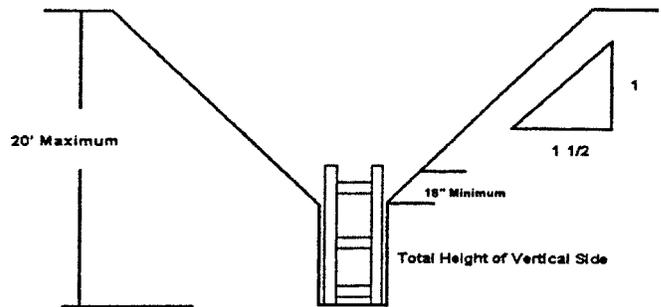
**Figure N-11  
Simple Configurations  
for Type C Soil**



**Simple Slope**

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.

**Figure N-12  
Slope  
Configurations  
for Type C Soil  
Support or Shield System**



**Vertically Sided Lower Portion**

All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1 1/2:1. All other simple slope, compound slope and vertically sided lower portion excavations shall be in accordance with options permitted under RCW WAC 296-155-657(2).

**Figure N-13  
EXCAVATIONS MADE IN LAYERED SOILS**

All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.

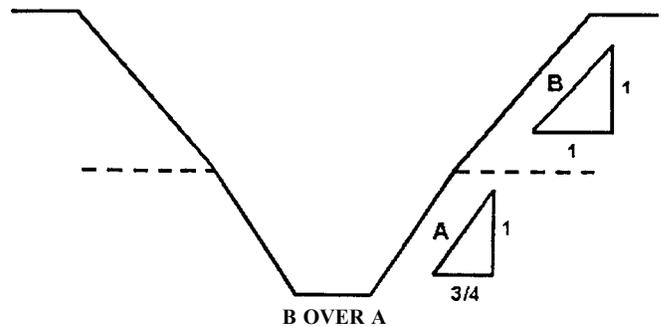


Figure N-14

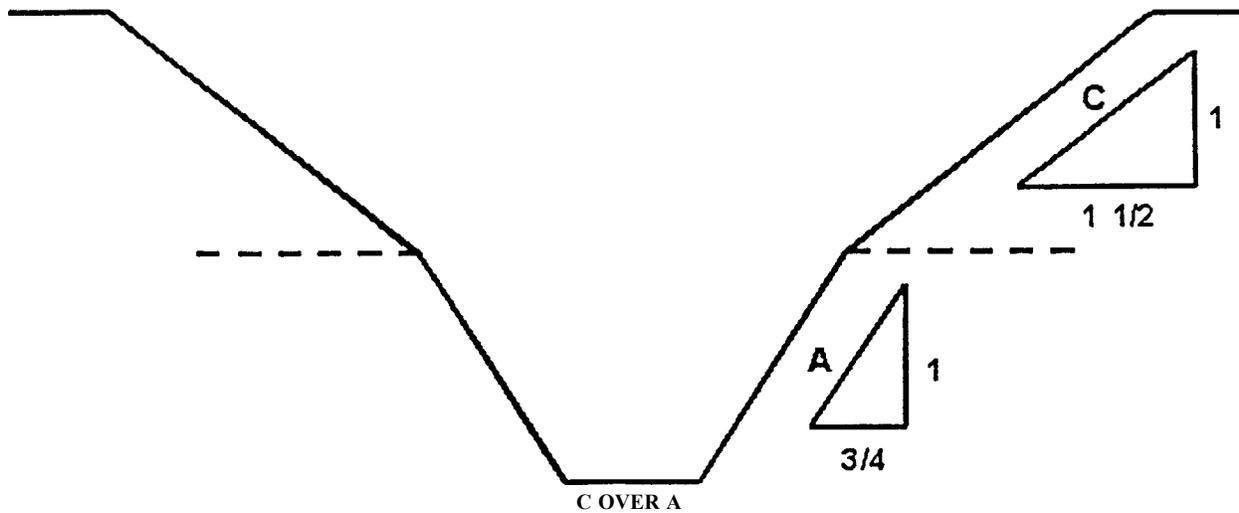


Figure N-15

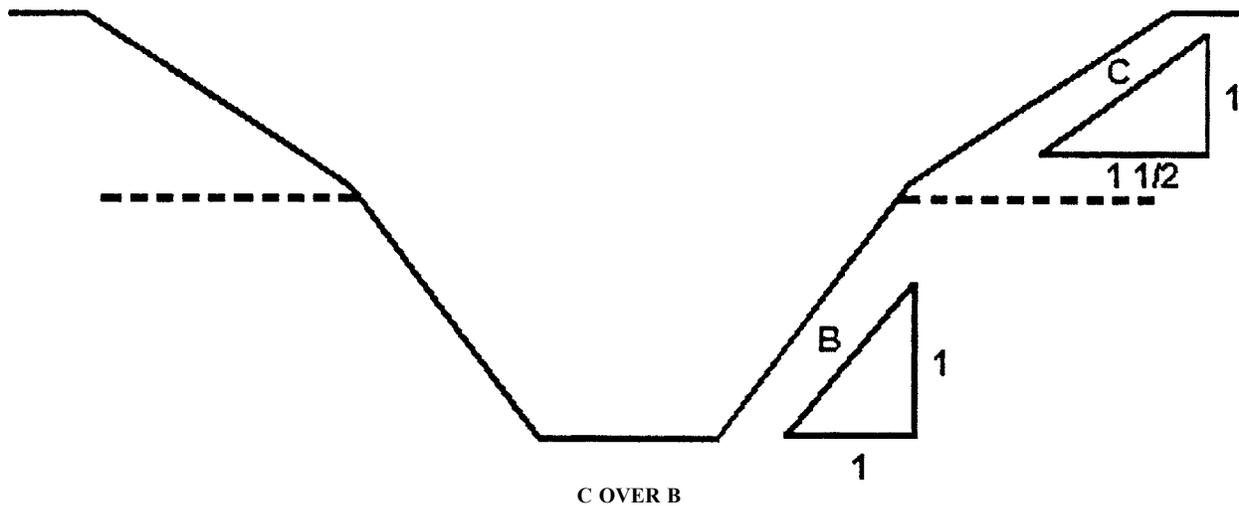


Figure N-16

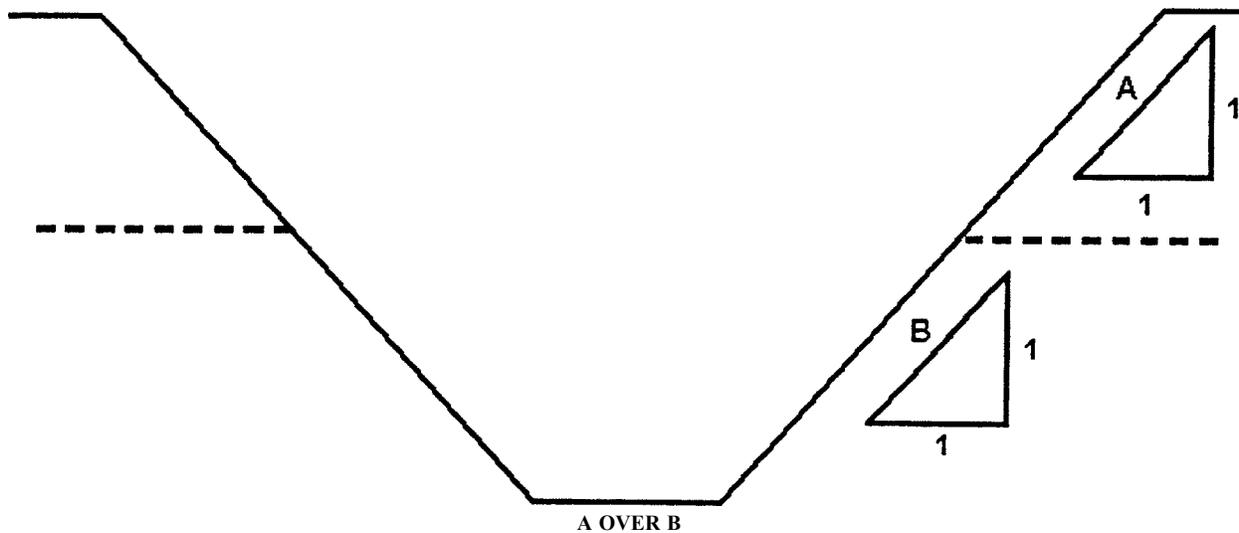


Figure N-17

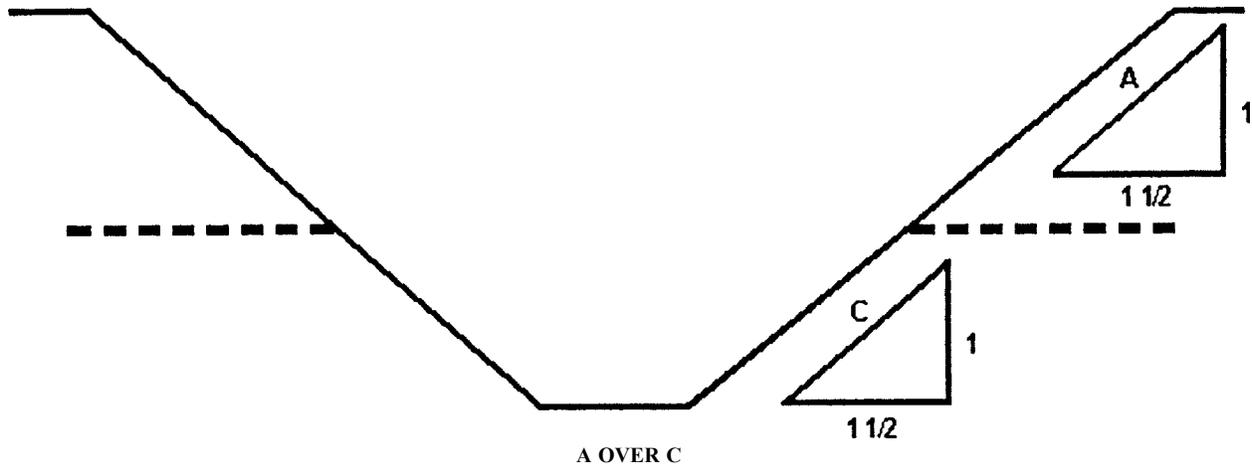
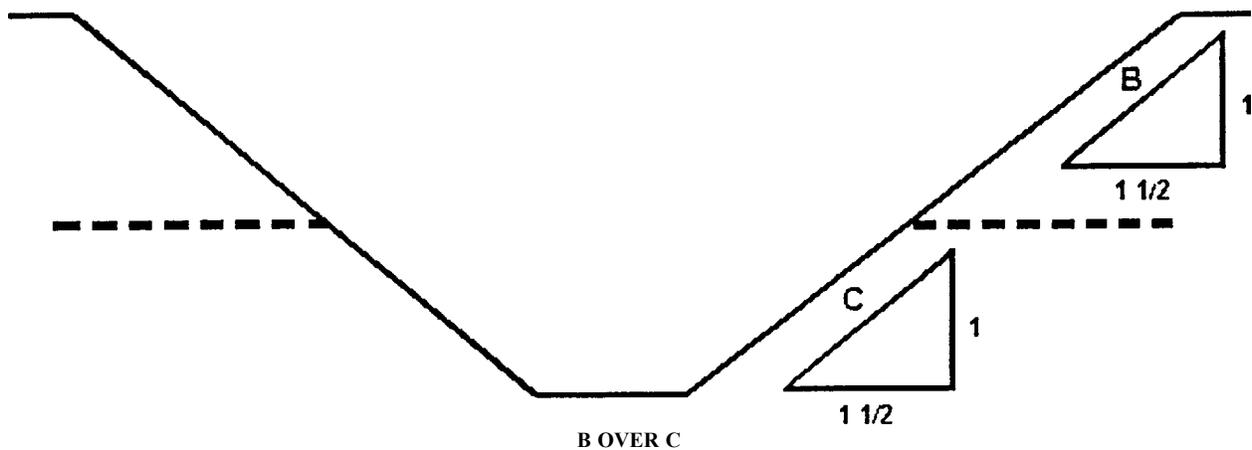


Figure N-18



[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-17-094, § 296-155-66403, filed 8/17/99, effective 12/1/99. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66403, filed 10/30/92, effective 12/8/92.]

**WAC 296-155-66405 Appendix C—Timber shoring for trenches.** (1) Scope. This appendix contains information that can be used when timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20 feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with WAC 296-155-657 (3)(a). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems such as sloping, benching, shielding, and freezing systems must be designed in accordance with the requirements set forth in WAC 296-155-657 (2) and (3).

(2) Soil classification. In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of this part.

(3) Presentation of information. Information is presented in several forms as follows:

(a) Information is presented in tabular form in Tables N-2 through N-7 following subsection (7) of this appendix. Each table presents the minimum sizes of timber members to

use in a shoring system, and each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stable rock is exempt from shoring requirements and therefore, no data are presented for this condition.

(b) Information concerning the basis of the tabular data and the limitations of the data is presented in subsection (4) of this appendix, and on the tables themselves.

(c) Information explaining the use of the tabular data is presented in subsection (5) of this appendix.

(d) Information illustrating the use of the tabular data is presented in subsection (6) of this appendix.

(e) Miscellaneous notations regarding Tables N-2 through N-7 are presented in subsection (7) of this Appendix.

(4) Basis and limitations of the data.

(a) Dimensions of timber members.

(i) The sizes of the timber members listed in Tables N-2 through N-7 are taken from the National Bureau of Standards

(NBS) report, "Recommended Technical Provisions for Construction Practice in Shoring and Sloping of Trenches and Excavations." In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(ii) The required dimensions of the members listed in Tables N-2, N-3, and N-4 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables N-5, N-6, and N-7, or have this choice under WAC 296-155-657 (3)(c), and are referred to The Corps of Engineers, The Bureau of Reclamation or data from other acceptable sources.

(b) Limitation of application.

(i) It is not intended that the timber shoring specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in WAC 296-155-657(3).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with WAC 296-155-657.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term "adjacent" as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on cross braces exceed a 240-pound gravity load distributed on a one-foot section of the center of the crossbrace.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(5) Use of Tables. The members of the shoring system that are to be selected using this information are the cross braces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A of this Part. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the cross-

braces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(6) Examples to illustrate the use of Tables N-2 through N-4.

(a) Example 1.

A trench dug in Type A soil is 13 feet deep and five feet wide.

From Table N-2, for acceptable arrangements of timber can be used.

Arrangement #1

Space 4x4 crossbraces at six feet horizontally and four feet vertically.

Wales are not required.

Space 3x8 uprights at six feet horizontally. This arrangement is commonly called "skip shoring."

Arrangement #2

Space 4x6 crossbraces at eight feet horizontally and four feet vertically.

Space 8x8 wales at four feet vertically.

Space 2x6 uprights at four feet horizontally.

Arrangement #3

Space 6x6 crossbraces at 10 feet horizontally and four feet vertically.

Space 8x10 wales at four feet vertically.

Space 2x6 uprights at five feet horizontally.

Arrangement #4

Space 6x6 crossbraces at 12 feet horizontally and four feet vertically.

Space 10x10 wales at four feet vertically.

Space 3x8 uprights at six feet horizontally.

(b) Example 2.

A trench dug in Type B soil in 13 feet deep and five feet wide.

From Table N-3 three acceptable arrangements of members are listed.

Arrangement #1

Space 6x6 crossbraces at six feet horizontally and five feet vertically.

Space 8x8 wales at five feet vertically.

Space 2x6 uprights at two feet horizontally.

Arrangement #2

Space 6x8 crossbraces at eight feet horizontally and five feet vertically.

Space 10x10 wales at five feet vertically.

Space 2x6 uprights at two feet horizontally.

Arrangement #3

Space 8x8 crossbraces at 10 feet horizontally and five feet vertically.

Space 10x12 wales at five feet vertically.

Space 2x6 uprights at two feet vertically.

(c) Example 3.

A trench dug Type C soil is 13 feet deep and five feet wide.

From Table N-4 two acceptable arrangements of members can be used.

Arrangement #1

Space 8x8 crossbraces at six feet horizontally and five feet vertically.

Space 10x12 wales at five feet vertically.

Position 2x6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

Arrangement #2

Space 8x10 crossbraces at eight feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Position 2x6 uprights in a close sheeting configuration unless water pressure must be resisted. Tight sheeting must be used where water must be retained.

(d) Example 4.

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is over 15 feet in depth is determined using Table N-4. Only one arrangement of members is provided.

Space 8x10 crossbraces at six feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Use 3x6 tight sheeting.

Use of Tables N-5, N-6, and N-7 would follow the same procedures.

(7) Notes for all tables.

(a) Member sizes at spacings other than indicated are to be determined as specified in WAC 296-155-657(3). "Design of Protective Systems."

(b) When conditions are saturated or submerged use Tight Sheeting. Tight Sheeting refers to the use of specially-edged timber planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

(c) All spacing indicated is measured center to center.

(d) Wales to be installed with greater dimension horizontal.

(e) If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the toe of the trench side.

(f) Trench jacks may be used in lieu of or in combination with timber crossbraces.

(g) Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

TABLE N-2  
**TIMBER TRENCH SHORING — MINIMUM TIMBER REQUIREMENTS\***  
 SOIL TYPE A P<sub>a</sub> - 25 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **													
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		UPRIGHTS				
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15		SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
									CLOSE	4	5	6	8	
4 TO 10	UP TO 6	4 X 4	4 X 4	4 X 6	6 X 6	6 X 6	4	Not Req'd	—				2 X 6	
	UP TO 8	4 X 4	4 X 4	4 X 6	6 X 6	6 X 6	4	Not Req'd	—					2 X 8
	UP TO 10	4 X 6	4 X 6	4 X 6	6 X 6	6 X 6	4	8 X 8	4			2 X 6		
	UP TO 12	4 X 6	4 X 6	6 X 6	6 X 6	6 X 6	4	8 X 8	4				2 X 6	
10 TO 15	UP TO 6	4 X 4	4 X 4	4 X 6	6 X 6	6 X 6	4	Not Req'd	—				3 X 8	
	UP TO 8	4 X 6	4 X 6	6 X 6	6 X 6	6 X 6	4	8 X 8	4		2 X 6			
	UP TO 10	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	4	8 X 10	4			2 X 6		
	UP TO 12	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	4	10 X 10	4				3 X 8	
15 TO 20	UP TO 6	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	4	6 X 8	4	3 X 6				
	UP TO 8	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	4	8 X 8	4	3 X 6				
	UP TO 10	8 X 8	8 X 8	8 X 8	8 X 8	8 X 10	4	8 X 10	4	3 X 6				
	UP TO 12	8 X 8	8 X 8	8 X 8	8 X 8	8 X 10	4	10 X 10	4	3 X 6				
OVER 20	SEE NOTE 1													

\* Mixed oak or equivalent with a bending strength not less than 850 psi.

\*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE N-3  
**TIMBER TRENCH SHORING — MINIMUM TIMBER REQUIREMENTS\***  
 SOIL TYPE B P<sub>a</sub> - 45 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **														
	HORIZ. SPACING (FEET)	CROSS BRACES					WALES			UPRIGHTS					
		WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)	SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)					
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE	2	3			
4 TO 10	UP TO 6	4 X 6	4 X 6	6 X 6	6 X 6	6 X 6	5	6 X 8	5				2 X 6		
	UP TO 8	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	5	8 X 10	5				2 X 6		
	UP TO 10	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	5	10 X 10	5				2 X 6		
	See Note 1														
10 TO 15	UP TO 6	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	5	8 X 8	5				2 X 6		
	UP TO 8	6 X 8	6 X 8	6 X 8	8 X 8	8 X 8	5	10 X 10	5				2 X 6		
	UP TO 10	8 X 8	8 X 8	8 X 8	8 X 8	8 X 10	5	10 X 12	5				2 X 6		
	See Note 1														
15 TO 20	UP TO 6	6 X 8	6 X 8	6 X 8	8 X 8	8 X 8	5	8 X 10	5	3 X 6					
	UP TO 8	8 X 8	8 X 8	8 X 8	8 X 8	8 X 10	5	10 X 12	5	3 X 6					
	UP TO 10	8 X 10	8 X 10	8 X 10	8 X 10	10 X 10	5	12 X 12	5	3 X 6					
	See Note 1														
OVER 20	SEE NOTE 1														

\* Mixed oak or equivalent with a bending strength not less than 850 psi.

\*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE N-4  
**TIMBER TRENCH SHORING — MINIMUM TIMBER REQUIREMENTS\***  
 SOIL TYPE C P<sub>a</sub> - 80 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **														
	HORIZ. SPACING (FEET)	CROSS BRACES					WALES			UPRIGHTS					
		WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)	SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)					
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE					
4 TO 10	UP TO 6	6 X 8	6 X 8	6 X 8	8 X 8	8 X 8	5	8 X 10	5	2 X 6					
	UP TO 8	8 X 8	8 X 8	8 X 8	8 X 8	8 X 10	5	10 X 12	5	2 X 6					
	UP TO 10	8 X 10	8 X 10	8 X 10	8 X 10	10 X 10	5	12 X 12	5	2 X 6					
	See Note 1														
10 TO 15	UP TO 6	8 X 8	8 X 8	8 X 8	8 X 8	8 X 10	5	10 X 12	5	2 X 6					
	UP TO 8	8 X 10	8 X 10	8 X 10	8 X 10	10 X 10	5	12 X 12	5	2 X 6					
	See Note 1														
	See Note 1														
15 TO 20	UP TO 6	8 X 10	8 X 10	8 X 10	8 X 10	10 X 10	5	12 X 12	5	3 X 6					
	See Note 1														
	See Note 1														
	See Note 1														
OVER 20	SEE NOTE 1														

\* Mixed oak or equivalent with a bending strength not less than 850 psi.

\*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE N-5  
TIMBER TRENCH SHORING — MINIMUM TIMBER REQUIREMENTS\*  
 SOIL TYPE A P<sub>a</sub> - 25 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **													
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		UPRIGHTS				
		WIDTH OF TRENCH (FEET)						SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE	4	5	6	8
4 TO 10	UP TO 6	4 X 4	4 X 4	4 X 4	4 X 4	4 X 6	4	Not Req'd	Not Req'd				4 X 6	
	UP TO 8	4 X 4	4 X 4	4 X 4	4 X 6	4 X 6	4	Not Req'd	Not Req'd					4 X 8
	UP TO 10	4 X 6	4 X 6	4 X 6	6 X 6	6 X 6	4	8 X 8	4			4 X 6		
	UP TO 12	4 X 6	4 X 6	4 X 6	6 X 6	6 X 6	4	8 X 8	4				4 X 6	
10 TO 15	UP TO 6	4 X 4	4 X 4	4 X 4	6 X 6	6 X 6	4	Not Req'd	Not Req'd				4 X 10	
	UP TO 8	4 X 6	4 X 6	4 X 6	6 X 6	6 X 6	4	6 X 8	4			4 X 6		
	UP TO 10	6 X 6	6 X 6	6 X 6	6 X 6	6 X 6	4	8 X 8	4			4 X 8		
	UP TO 12	6 X 6	6 X 6	6 X 6	6 X 6	6 X 6	4	8 X 10	4			4 X 6		4 X 10
15 TO 20	UP TO 6	6 X 6	6 X 6	6 X 6	6 X 6	6 X 6	4	6 X 8	4	3 X 6				
	UP TO 8	6 X 6	6 X 6	6 X 6	6 X 6	6 X 6	4	8 X 8	4	3 X 6	4 X 12			
	UP TO 10	6 X 6	6 X 6	6 X 6	6 X 6	6 X 8	4	8 X 10	4	3 X 6				
	UP TO 12	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	4	8 X 12	4	3 X 6	4 X 12			
OVER 20	SEE NOTE 1													

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE N-6  
TIMBER TRENCH SHORING — MINIMUM TIMBER REQUIREMENTS\*  
 SOIL TYPE B P<sub>a</sub> - 45 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **													
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		UPRIGHTS				
		WIDTH OF TRENCH (FEET)						SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE	2	3	4	6
4 TO 10	UP TO 6	4 X 6	4 X 6	4 X 6	6 X 6	6 X 6	5	6 X 8	5			3 X 12	4 X 8	4 X 12
	UP TO 8	4 X 6	4 X 6	6 X 6	6 X 6	6 X 6	5	8 X 8	5		3 X 8		4 X 8	
	UP TO 10	4 X 6	4 X 6	6 X 6	6 X 6	6 X 8	5	8 X 10	5			4 X 8		
	See Note 1													
10 TO 15	UP TO 6	6 X 6	6 X 6	6 X 6	6 X 8	6 X 8	5	8 X 8	5	3 X 6	4 X 10			
	UP TO 8	6 X 6	6 X 8	6 X 8	8 X 8	8 X 8	5	10 X 10	5	3 X 6	4 X 10			
	UP TO 10	6 X 8	6 X 8	8 X 8	8 X 8	8 X 8	5	10 X 12	5	3 X 6	4 X 10			
	See Note 1													
15 TO 20	UP TO 6	6 X 8	6 X 8	6 X 8	6 X 8	8 X 8	5	8 X 10	5	4 X 6				
	UP TO 8	6 X 8	6 X 8	6 X 8	8 X 8	8 X 8	5	10 X 12	5	4 X 6				
	UP TO 10	8 X 8	8 X 8	8 X 8	8 X 8	8 X 8	5	12 X 12	5	4 X 6				
	See Note 1													
OVER 20	SEE NOTE 1													

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE N-7  
**TIMBER TRENCH SHORING — MINIMUM TIMBER REQUIREMENTS\***  
 SOIL TYPE C P<sub>a</sub> - 80 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (34S) AND SPACING OF MEMBERS **													
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		UPRIGHTS				
		WIDTH OF TRENCH (FEET)						SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE				
4 TO 10	UP TO 6	6 X 6	6 X 6	6 X 6	6 X 6	8 X 8	5	8 X 8	5	3 X 6				
	UP TO 8	6 X 6	6 X 6	6 X 6	8 X 8	8 X 8	5	10 X 10	5	3 X 6				
	UP TO 10	6 X 6	6 X 6	8 X 8	8 X 8	8 X 8	5	10 X 12	5	3 X 6				
	See Note 1													
10 TO 15	UP TO 6	6 X 8	6 X 8	6 X 8	8 X 8	8 X 8	5	10 X 10	5	4 X 6				
	UP TO 8	8 X 8	8 X 8	8 X 8	8 X 8	8 X 8	5	12 X 12	5	4 X 6				
	See Note 1													
	See Note 1													
15 TO 20	UP TO 6	8 X 8	8 X 8	8 X 8	8 X 10	8 X 10	5	10 X 12	5	4 X 6				
	See Note 1													
	See Note 1													
	See Note 1													
OVER 20	SEE NOTE 1													

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050. 02-12-098, § 296-155-66405, filed 6/5/02, effective 8/1/02. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66405, filed 10/30/92, effective 12/8/92.]

**WAC 296-155-66407 Appendix D—Aluminum hydraulic shoring for trenches.** (1) Scope. This appendix contains information that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with WAC 296-155-657 (3)(b).

(2) Soil Classification. In order to use data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of this Part.

(3) Presentation of information. Information is presented in several forms as follows:

(a) Information is presented in tabular form in Tables N-8 through N-11. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables N-8 and N-9 are for vertical shores in Types A and B soil. Tables N-10 and N-11 are for horizontal waler systems in Types B and C soil.

(b) Information concerning the basis of the tabular data and the limitations of the data is presented in subsection (4) of this appendix.

(c) Information explaining the use of the tabular data is presented in subsection (5) of this appendix.

(d) Information illustrating the use of the tabular data is presented in subsection (6) of this appendix.

(e) Miscellaneous notations (footnotes) regarding Table N-8 through N-11 are presented in subsection (7) of this appendix.

(f) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring: Typical Installations."

(4) Basis and limitations of the data.

(a) Vertical shore rails and horizontal wales are those that meet the Section Modulus requirements in Tables N-8 through N-10. Aluminum material is 6061-T6 or material of equivalent strength and properties.

(b) Hydraulic cylinders specifications.

(i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of no less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at extensions as recommended by product manufacturer.

## (c) Limitation of application.

(i) It is not intended that the aluminum hydraulic specifications apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be otherwise designed as specified in WAC 296-155-657(3).

(ii) When any of the following conditions are present; the members specified in the Tables are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with WAC 296-155-657.

(A) When vertical loads imposed on cross braces exceed a 100 Pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(C) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The slope portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(5) Use of Tables N-8 through N-11. The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables N-8 and N-9 for vertical shores are used in Type A and B soils that do not require sheeting. Type B soils that may require sheeting, and Type C soils that always require sheeting are found in the horizontal wale Tables N-10 and N-11. The soil type must first be determined in accordance with the soil classification system described in appendix A of this Part. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

## (6) Example to Illustrate the Use of the Tables:

(a) Example 1: A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table N-8: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures N-23 & N-25 for typical installations.)

(b) Example 2: A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table N-9: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures N-23 & N-25 for typical installations.)

(c) A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The trench is 16 feet deep and 9 feet wide. From Table N-9: Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by subdivision (7)(b))

spaced 5.5 feet o.c. horizontally and 4 feet o.c. vertically, plywood (per subdivision (7)(g) to the N-8 through N-11 Tables) should be used behind the shores. (See Figures N-24 & N-25 for typical installations.)

(d) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep and 12 feet wide. 8 foot horizontal spacing between cylinders is desired for working space. From Table N-10: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally, 3x12 timber sheeting is required at close spacing vertically. (See Figure N-26 for typical installation.)

(e) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is desired for working space. From Table N-11: Find horizontal wale with a section modulus of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3x12 timber sheeting is required at close spacing vertically. (See Figure N-26 for typical installation.)

(7) Footnotes, and general notes, for Tables N-8 through N-11.

(a) For applications other than those listed in the tables, refer to WAC 296-155-657 (3)(b) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to WAC 296-155-657 (3)(b) and (c).

(b) 2-inch diameter cylinders, at this width, shall have structural steel tube (3.5x3.5x0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

## (c) Hydraulic cylinders capacities.

(i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe work capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(d) All spacing indicated is measured center to center.

(e) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(f) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(g) Plywood shall be 1.125 in. thick softwood or 0.75 inch thick, 14 ply, arctic white birch (Finland form).

Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(h) See appendix C for timber specifications.

(i) Wales are calculated for simple span conditions.

(j) See subsection (4) of this appendix, for basis and limitations of the data.

ALUMINUM HYDRAULIC SHORING  
TYPICAL INSTALLATIONS

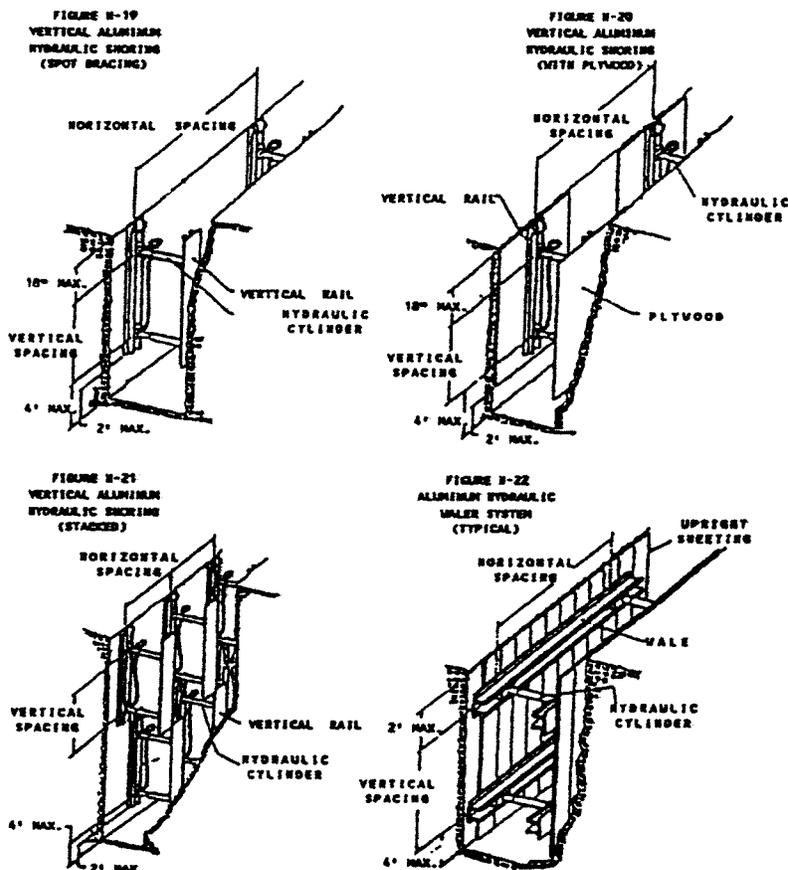


TABLE N-8  
ALUMINUM HYDRAULIC SHORING VERTICAL SHORES FOR SOIL TYPE A

Depth of Trench (Feet)	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Hydraulic Cylinders		
			Width of Trench (Feet)		
			Up to 8	Over 8 Up to 12	Over 12 Up to 15
Over 4 Up to 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
Over 10 Up to 15	8				
Over 15 Up to 20	7				
Over 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)

Note (1): See Appendix D, WAC 296-155-66407 (7)(a)

Note (2): See Appendix D, WAC 296-155-66407 (7)(b)

TABLE N-9  
ALUMINUM HYDRAULIC SHORING VERTICAL SHORES FOR SOIL TYPE B

Depth of Trench (Feet)	Hydraulic Cylinders				
	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Width of Trench (Feet)		
			Up to 8	Over 8 Up to 12	Over 12 Up to 15
Over 4 Up to 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
Over 10 Up to 15	6.5				
Over 15 Up to 20	5.5				
Over 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)

Note (1): See Appendix D, WAC 296-155-66407 (7)(a)

Note (2): See Appendix D, WAC 296-155-66407 (7)(b)

TABLE N-10  
ALUMINUM HYDRAULIC SHORING WALER SYSTEMS FOR SOIL TYPE B

Depth of Trench (Feet)	Wales		Hydraulic Cylinders						Timber Uprights		
	Vertical Spacing (Feet)	Section* Modulus (In <sup>3</sup> )	Width of Trench (Feet)						Max. Horizontal Spacing (on Center)		
			Up to 8		Over 8 Up to 12		Over 12 Up to 15		Solid Sheet	2 Feet	3 Feet
			Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
Over 4 Up to 10	4	3.5	8.0	2 IN	8.0	2 IN Note (2)	8.0	3 IN	---	---	3 X 12
		7.0	9.0	2 IN	9.0	2 IN Note (2)	9.0	3 IN			
		14.0	12.0	3 IN	12.0	3 IN	12.0	3 IN			
Over 10 Up to 15	4	3.5	6.0	2 IN	6.0	2 IN Note (2)	6.0	3 IN	---	3 X 12	---
		7.0	8.0	3 IN	8.0	3 IN	8.0	3 IN			
		14.0	10.0	3 IN	10.0	3 IN	10.0	3 IN			
Over 15 Up to 20	4	3.5	5.5	2 IN	5.5	2 IN Note (2)	5.5	3 IN	3 X 12	---	---
		7.0	6.0	3 IN	6.0	3 IN	6.0	3 IN			
		14.0	9.0	3 IN	9.0	3 IN	9.0	3 IN			
Over 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)

Note (1): See Appendix D, WAC 296-155-66407 (7)(a)

Note (2): See Appendix D, WAC 296-155-66407 (7)(b)

\*Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE N-11  
ALUMINUM HYDRAULIC SHORING WALER SYSTEMS FOR SOIL TYPE C

Depth of Trench (Feet)	Wales		Hydraulic Cylinders						Timber Uprights		
	Vertical Spacing (Feet)	Section <sup>a</sup> Modulus (In <sup>3</sup> )	Width of Trench (Feet):						Max. Horizontal Spacing (on Center)		
			Up to 8		Over 8 Up to 12		Over 12 Up to 15		Solid Sheet	2 Feet	3 Feet
			Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
Over 4 Up to 10	4	3.5	6.0	2 IN	6.0	2 IN	6.0	3 IN	3 X 12	—	—
		7.0	6.5	2 IN	6.5	2 IN	6.5	3 IN			
		14.0	10.0	3 IN	10.0	3 IN	10.0	3 IN			
Over 10 Up to 15	4	3.5	4.0	2 IN	4.0	2 IN	4.0	3 IN	3 X 12	—	—
		7.0	5.5	3 IN	5.5	3 IN	5.5	3 IN			
		14.0	8.0	3 IN	8.0	3 IN	8.0	3 IN			
Over 15 Up to 20	4	3.5	3.5	2 IN	3.5	2 IN	3.5	3 IN	3 X 12	—	—
		7.0	5.0	3 IN	5.0	3 IN	5.0	3 IN			
		14.0	6.0	3 IN	6.0	3 IN	6.0	3 IN			
Over 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)

Note (1): See Appendix D, WAC 296-155-66407 (7)(a)

Note (2): See Appendix D, WAC 296-155-66407 (7)(b)

\*Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66407, filed 10/30/92, effective 12/8/92.]

WAC 296-155-66409 Appendix E—Alternatives to timber shoring.

Appendix E to part N - Alternatives to Timber Shoring  
Figure N-23, Aluminum Hydraulic Shoring

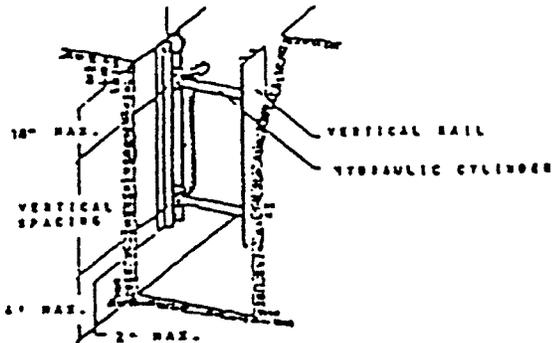


Figure N-24, Pneumatic/hydraulic Shoring

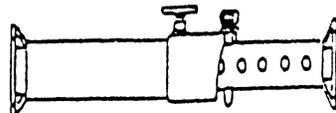
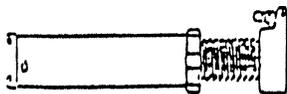


Figure N-25, Trench Jacks (Screw Jacks)

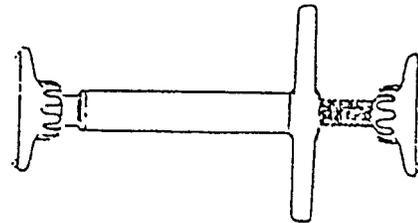
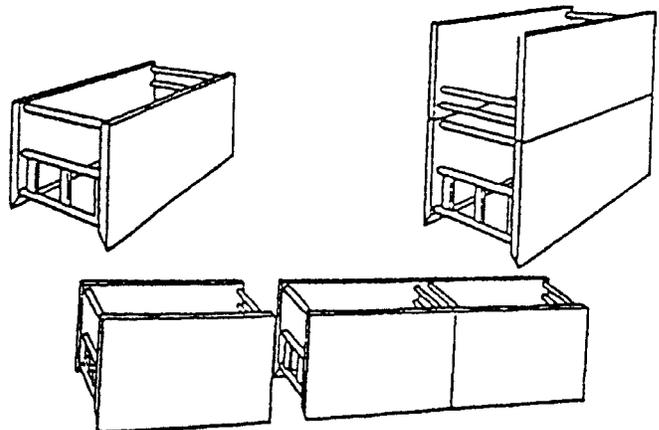


Figure N-26, Trench Shields



[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66409, filed 10/30/92, effective 12/8/92.]

**WAC 296-155-66411 Appendix F—Selection of protective systems.** The following figures are a graphic summary of the requirements contained in Part N for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with WAC 296-155-657 (2) and (3).

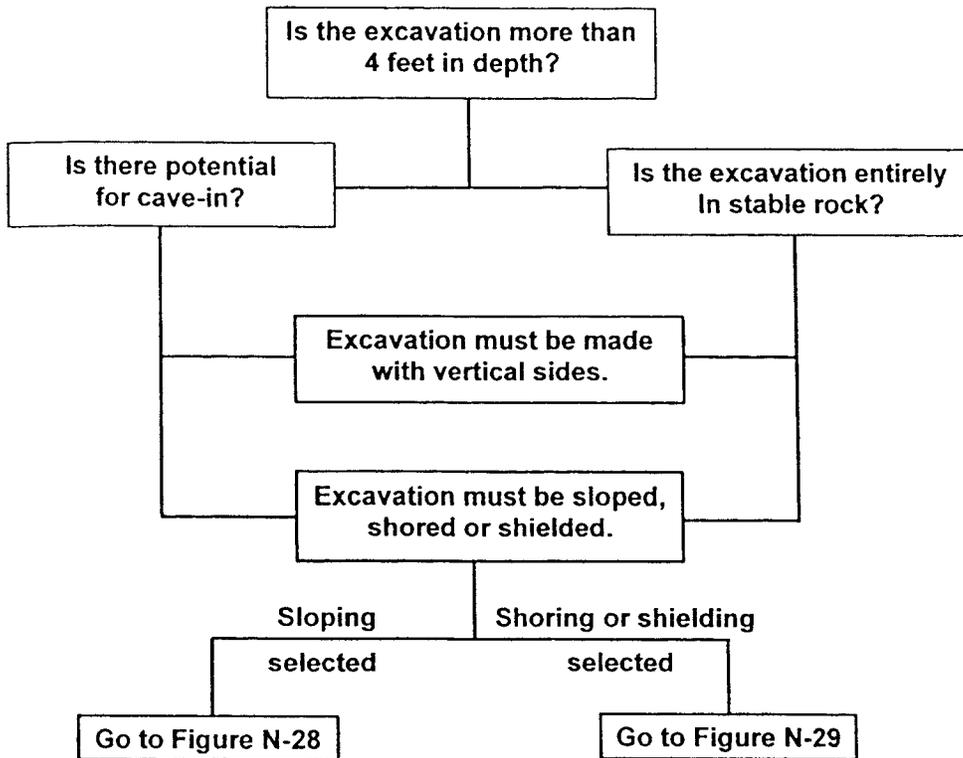


FIGURE N-27 - PRELIMINARY DECISIONS

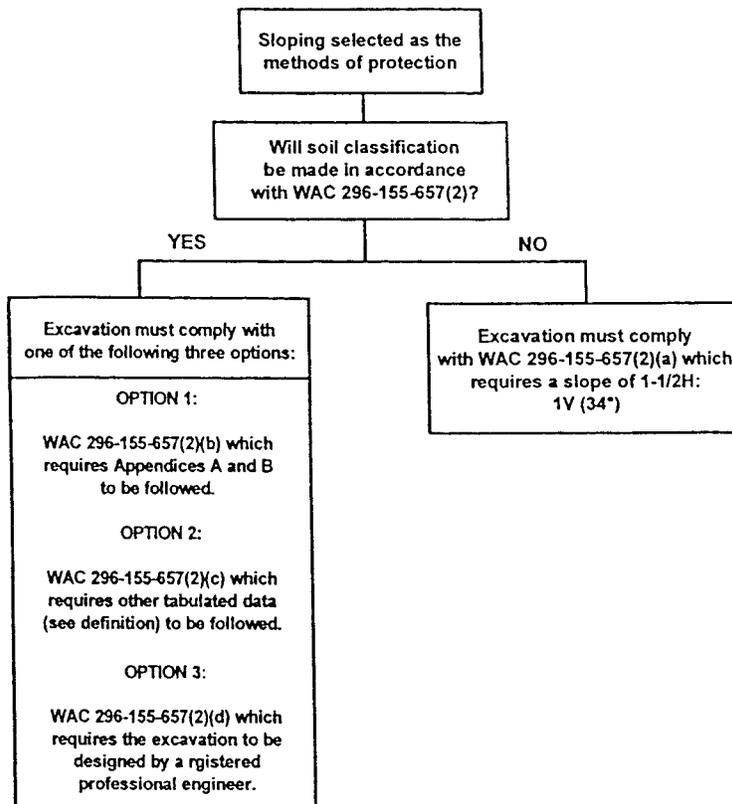


FIGURE N-28 - SLOPING OPTIONS

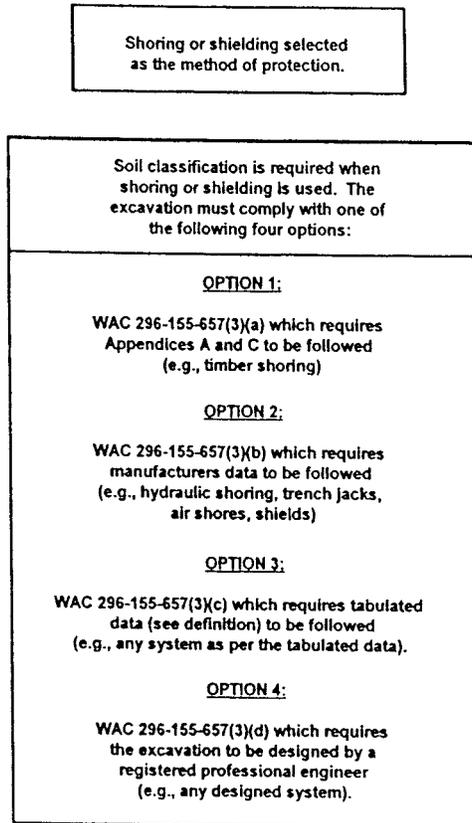


FIGURE N-29 - SHORING AND SHIELDING OPTIONS

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050. 02-12-098, § 296-155-66411, filed 6/5/02, effective 8/1/02. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66411, filed 10/30/92, effective 12/8/92.]

**PART O  
CONCRETE, CONCRETE FORMS, SHORING, AND  
MASONRY CONSTRUCTION**

**WAC 296-155-675 Scope, application, and definitions applicable to this part.** (1) Scope and application. This part sets forth requirements to protect all construction employees from the hazards associated with concrete and masonry construction operations performed in workplaces covered under chapter 296-155 WAC.

(2) Definitions applicable to this part.

(a) "Bull float" means a tool used to spread out and smooth the concrete.

(b) "Formwork" means the total system of support for freshly placed or partially cured concrete, including the mold or sheeting (form) that is in contact with the concrete as well as all supporting members including shores, reshores, hardware, braces, and related hardware.

(c) "Jacking operation" means the task of lifting a slab (or group of slabs) vertically from one location to another (e.g., from the casting location to a temporary (parked) location, or from a temporary location to another temporary location, or to its final location in the structure), during the construction of a building/structure where the lift-slab process is being used.

(d) "Lift slab" means a method of concrete construction in which floor and roof slabs are cast on or at ground level and, using jacks, lifted into position.

(e) "Limited access zone" means an area alongside a masonry wall, which is under construction, and which is clearly demarcated to limit access by employees.

(f) "Precast concrete" means concrete members (such as walls, panels, slabs, columns, and beams) which have been formed, cast, and cured prior to final placement in a structure.

(g) "Reshoring" means the construction operation in which shoring equipment (also called reshores or reshoring equipment) is placed, as the original forms and shores are removed, in order to support partially cured concrete and construction loads.

(h) "Shore" means a supporting member that resists a compressive force imposed by a load.

(i) "Vertical slip forms" means forms which are jacked vertically during the placement of concrete.

(j) "Guy" means a line that steadies a high piece or structure by pulling against an off-center load.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-675, filed 7/20/94, effective 9/20/94; 91-11-070 (Order 91-01), § 296-155-675, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-155-675, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-675, filed 5/15/89, effective 6/30/89; Order 74-26, § 296-155-675, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-680 General provisions.** (1) General. All equipment, material and construction techniques used in concrete construction and masonry work shall meet the applicable requirements for design, construction, inspection, testing, maintenance and operations as prescribed in ANSI

A10.9-1970, Safety Requirements for Concrete Construction and Masonry Work.

(2) Construction loads. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.

(3) Vertical loads. Vertical loads consist of a dead load plus an allowance for live load. The weight of formwork together with the weight of freshly placed concrete is dead load. The live load consists of the weight of workers, equipment, runways and impact, and shall be computed in pounds per square foot (psf) of horizontal projection.

(4) Lateral loads. Braces and shores shall be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one hundred pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. Wall forms shall be designed for a minimum wind load of ten psf, and bracing for wall forms should be designed for a lateral load of at least one hundred pounds per lineal foot of wall, applied at the top. Walls of unusual height require special consideration.

(5) Special loads. Formwork shall be designed for all special conditions of construction likely to occur, such as unsymmetrical placement of concrete, impact of machine-delivered concrete, uplift, and concentrated loads.

(6) Form supports and wedges shall be checked during concrete placement to prevent distortion or failure.

(7) Reinforcing steel.

(a) All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.

(b) Wire mesh rolls: Wire mesh rolls shall be secured at each end to prevent dangerous recoiling action.

(c) Guying: Reinforcing steel for walls, piers, columns, and similar vertical structures shall be guyed and supported to prevent overturning and to prevent collapse.

(8) Post-tensioning operations.

(a) No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations.

(b) Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

(9) Working under loads.

(a) No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.

(b) To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(10) Personal protective equipment.

(a) No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

(b) No employee shall be permitted to place or tie reinforcing steel more than six feet (1.8 m) above any adjacent working surface unless the employee is protected by personal fall arrest systems, safety net systems, or positioning device systems meeting the criteria of chapter 296-155 WAC, Part C-1.

(c) Each employee on the face of formwork or reinforcing steel shall be protected from falling 6 feet (1.8m) or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems meeting the criteria of chapter 296-155 WAC, Part C-1.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-14-058, § 296-155-680, filed 7/3/00, effective 10/1/00. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-680, filed 7/20/94, effective 9/20/94; 90-17-051 (Order 90-10), § 296-155-680, filed 8/13/90, effective 9/24/90; 90-03-029 (Order 89-20), § 296-155-680, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-680, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-680, filed 1/21/86; Order 74-26, § 296-155-680, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-681 Safe walking surfaces on concrete structural members.** Structural members with studs, dowels, or shear connectors installed on the top side shall not be used as a walkway and/or means of access unless such studs, dowels, or shear connectors are covered with suitable material and in such a manner as to provide a walking surface at least as stable and free of hazards as the top surface of the member would provide without attachments installed.

Note: For the purpose of this section, "stud" means all protruding metal attachments to structural members.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-681, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-682 Requirements for equipment and tools.** (1) Bulk cement storage. Bulk storage bins, containers, and silos shall be equipped with the following:

(a) Conical or tapered bottoms; and

(b) Mechanical or pneumatic means of starting the flow of material.

(2) No employee shall be permitted to enter storage facilities unless the ejection system has been shut down and locked out in accordance with WAC 296-155-429.

(3) Safety belts, harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used as prescribed in chapter 296-155 WAC, Part C-1.

(4) Concrete mixers. Concrete mixers with one cubic yard (.8 m<sup>3</sup>) or larger loading skips shall be equipped with the following:

(a) A mechanical device to clear the skip of materials; and

(b) Guardrails installed on each side of the skip.

(5) Power concrete trowels. Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

(6) Concrete buggies. Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

Note: Installation of knuckle guards on buggy handles is recommended.

(7) Runways.

(a) Runways shall be constructed to carry the maximum contemplated load with a safety factor of four, have a smooth running surface, and be of sufficient width for two buggies to pass. Single runs to have a minimum width of forty-two inches with turnouts. Runways to have standard railings. Where motor driven concrete buggies are used, a minimum four-inches by four-inches wheel guard shall be securely fastened to outside edge of runways.

(b) All concrete buggy runways which are 12 inches or more above a work surface or floor, or ramps with more than 4 percent incline shall be considered "elevated" runways.

Exception: Small jobs utilizing only one concrete buggy, or larger jobs utilizing a "one-way traffic pattern" may be exempt from the requirements for "turnouts" or for "sufficient width for two buggies to pass."

Exemption: Runways less than 12 inches above the floor or ground which are utilized by hard-powered buggies only, may be exempt from the requirements for guardrails and wheelguards.

### (8) Concrete pumps and placing booms.

#### (a) Definitions.

"Concrete delivery hose" means a flexible concrete delivery hose which has two end couplings.

"Concrete pump" means a construction machine that pumps concrete.

"Controls" means the devices used to operate a machine.

"Delivery systems" means the pipe, hoses and components, through which the concrete is pumped.

"Grooved end" means a pipe clamp pipe connection where a groove is machined or rolled directly into the outside of the pipe wall (for example: Victualic).

"Material pressure" means the pressure exerted on the concrete inside the delivery system.

"Placing boom and placing unit" means a manual or power driven, slewable working device which:

- Consists of one or more extendable or folding parts for supporting the concrete delivery system, and directs the discharge into the desired location; and

- May be mounted on trucks, trailers, or special vehicles.

"Qualified person" means someone who:

- Possesses a recognized degree or certificate of professional standing; or

- Has extensive knowledge, training, and experience; or

- Successfully demonstrated the ability to resolve problems relating to the work.

"Restraining devices" means a sling, cable, or equivalent device used to minimize excess movement of a delivery system in case of separation.

"Whip hoses" means a suspended hose that has only one coupling and is used to direct the delivery of concrete.

#### (b) Equipment requirements.

##### (i) Equipment identification tag.

The employer must ensure the following identification is furnished if originally identified by the manufacturer and on all pumps manufactured after January 1, 1998:

- The manufacturer's name;

- The year of manufacture;

- The model and serial number;

- The maximum material pressure;

- The maximum allowable pressure in the hydraulic system; and

(2007 Ed.)

- The maximum weight per foot of delivery system including concrete.

##### (ii) Manufacturer's manual.

The employer must have the manufacturer's operation/safety manual or equivalent available for each concrete pump or placing boom.

##### (iii) Unsafe condition of equipment.

If during an equipment inspection a condition is revealed that might endanger workers, the equipment must not be returned to service until the condition is corrected.

##### (iv) Controls.

Controls must have their function clearly marked.

##### (v) Hydraulic systems.

(A) Concrete pumps and placing booms hydraulic systems must have pressure relief valves to prevent cylinder and boom damage.

(B) Hydraulic systems must have hydraulic holding valves if hose or coupling failure could result in uncontrolled vertical movement.

##### (vi) Certification.

In the event of failure of a structural member, overloading, or contact with energized electric power lines and before return to service, the equipment must be certified safe by:

- The manufacturer; or
- An agent of the manufacturer; or
- A professional engineer.

(vii) Marking weight. A permanent, legible notice stating the total weight of the unit must be marked on:

- Trailer or skid mounted concrete pumps;
- Placing booms; and
- All major detachable components over five hundred pounds.

##### (viii) Lifting a pump.

A concrete pump must be lifted using the lift points specified by the manufacturer or a professional engineer.

##### (ix) Emergency shutoff.

A concrete pump must have a clearly labeled emergency stop switch that stops the pumping action.

##### (x) Inlet and outlet guarding.

(A) The waterbox must have a fixed guard to prevent unintentional access to the moving parts.

(B) The agitator must be guarded with a point of operation guard in accordance with chapter 296-806 WAC, Machine safety, and the guard must be:

- Hinged or bolted in place;
- At least three inches distance from the agitator;
- Be capable of supporting a load of two hundred fifty pounds.

(C) A person must not stand on the guard when the pump or agitator is running.

##### (xi) Outriggers.

(A) Outriggers must be used in accordance with the manufacturer's specifications.

(B) Concrete pump trucks manufactured after January 1, 1998, must have outriggers or jacks permanently marked to indicate the maximum loading they transmit to the ground.

##### (xii) Load on a placing boom.

(A) The manufacturer's or a licensed, registered, structural engineer's specifications for the placing boom must not be exceeded by:

- The weight of the load;

- The length and diameter of suspended hose;
  - The diameter and weight of mounted pipe.
- (B) A concrete placing boom must not be used to drag hoses or lift other loads.
- (C) All engineering calculations regarding modifications must be:
- Documented;
  - Recorded; and
  - Available upon request.
- (xiii) Pipe diameter thickness. The pipe wall thickness must be measured in accordance with the manufacturer's instruction, and:
- Be sufficient to maintain a burst pressure greater than the maximum pressure the pump can produce;
  - The pipe sections must be replaced when measurements indicate wall thickness has been reduced to the limits specified by the manufacturer.
- (xiv) Pipe clamps.
- (A) Concrete must not be pumped through a delivery system with grooved ends, such as those for Victualic-type couplers.
- (B) Pipe clamps must have a pressure rating at least equal to the pump pressure rating.
- (C) Pipe clamps contact surfaces must be free of concrete and other foreign matter.
- (D) If quick connect clamps are used, they must be pinned or secured to keep them from opening when used in a vertical application.
- (xv) Delivery pipe.
- (A) Delivery pipe between the concrete pump and the placing system must be supported and anchored to prevent movement and excessive loading on clamps.
- (B) Double ended hoses must not be used as whip hoses.
- (C) Attachments must not be placed on whip hoses (i.e., "S" hooks, valves, etc.).

Table 1, Nonmandatory  
Recommended maximum yards per hour through hose

Hose Diameter	Hose Length (12' and less) Max. yards per hour	Hose Length (12' and longer) Max. yards per hour
2"	30	30
3"	90	50
4"	160	110
5"	See manufacturer specs	See manufacturer specs

- The above figures are based on a minimum of a 4" slump and a 5 sack mix.
  - Variables in mix design can have an effect on these ratings.
  - Aggregate should not exceed 1/3 the diameter of the delivery system.
- (xvi) Restraining. A restraining device must:
- Be used on attachments suspended from the boom tips; and
  - Have a load rating not less than one-fifth of its ultimate breaking strength.
- (xvii) Equipment inspection.

- (A) An inspection must be conducted annually for the first five years and semiannually thereafter and must include the following:
- Nondestructive testing of all sections of the boom by a method capable of ensuring the structural integrity of the boom;
  - Be conducted by a qualified person or by a private agency.
- (B) The inspection report must be documented and a copy maintained by the employer and in each unit inspected. It must contain the following:
- The identification, including the serial numbers and manufacturer's name, of the components and parts inspected and tested;
  - A description of the test methods and results;
  - The names and qualifications of the people performing the inspection;
  - A listing of necessary repairs; and
  - The signature of the manufacturer, an agent of the manufacturer, or a qualified person.

Note: See WAC 296-155-628 (8)(d) for the inspection worksheet criteria.

- (xviii) Equipment repair.
- (A) Replacement parts must meet or exceed the original manufacturer's specifications or be certified by a registered professional structural engineer.
- (B) A properly certified welder must perform any welding on the boom, outrigger, or structural component.
- (xix) Compressed air cleaning of the piping system. To clean the piping system:
- (A) The pipe system must be securely anchored before it is cleaned out.
- (B) The flexible discharge hose must be removed.
- (C) Workers not essential to the cleaning process must leave the vicinity.
- (D) The compressed air system must have a shutoff valve.
- (E) Blow out caps must have a bleeder valve to relieve air pressure.
- (F) A trap basket or containment device (i.e., concrete truck, concrete bucket) must be available and secured to receive the clean out device.
- (G) Delivery pipes must be depressurized before clamps and fittings are released.
- (c) Qualification and training requirements.
- (i) Operator trainee—Qualification requirements. To be qualified to become a concrete pump operator, the trainee must meet the following requirements unless it can be shown that failure to meet the requirements will not affect the operation of the concrete pump boom.
- (A) Vision requirements:
- At least 20/30 Snellen in one eye and 20/50 in the other. Corrective lenses may be used to fulfill this requirement;
  - Ability to distinguish colors, regardless of position, if color differentiation is required;
  - Normal depth perception and field of vision.
- (B) Hearing requirements: Hearing adequate to meet operational demands. Corrective devices may be used to fulfill this requirement.

(ii) Operator trainee—Training requirements. Operator trainee training requirements include, but are not limited to, the following:

(A) Demonstrated their ability to read and comprehend the pump manufacturer's operation and safety manual.

(B) Be of legal age to perform the duties required.

(C) Received documented classroom training and testing (as applicable) on these recommended subjects:

- Driving, operating, cleaning and maintaining concrete pumps, placing booms, and related equipment;
- Jib/boom extensions;
- Boom length/angle;
- Manufacturer's variances;
- Radii;
- Range diagram, stability, tipping axis; and
- Structural/tipping determinations.

(D) Maintain and have available upon request a copy of all training materials and a record of training.

(E) Satisfactorily completed a written examination for the concrete pump boom for which they are becoming qualified. It will cover:

- Safety;
- Operational characteristics and limitations; and
- Controls.

(iii) Operator—Qualification requirements. Operators will be considered qualified when they have:

(A) Completed the operator trainee requirements listed in (c)(i) and (ii) of this subsection.

(B) Completed a program of training conducted by a qualified person, including practical experience under the direct supervision of a qualified person.

(C) Passed a practical operating examination of their ability to operate a specific model and type of equipment. Possess the knowledge and the ability to implement emergency procedures.

(D) Possess the knowledge regarding the restart procedure after emergency stop has been activated.

(E) Possess the proper class of driver's license to drive the concrete pump truck.

(F) Demonstrate the ability to comprehend and interpret all labels, safety decals, operator's manuals, and other information required to safely operate the concrete pump.

(G) Be familiar with the applicable safety requirements.

(H) Understand the responsibility for equipment maintenance.

(d) Concrete pump inspection worksheet criteria. Concrete pump trucks will be inspected using the following criteria: The manufacturer's required inspection criteria will be followed in all instances.

Note: DOT requirements for inspections - Ref. 49.C.F.R.396.11, Driver Vehicle Inspections and 396.13, Driver Pre-Trip Inspections; and WAC 296-155-610.

(i) Hydraulic systems.

- (A) Oil level;
- (B) Hoses;
- (C) Fittings;
- (D) Holding valves;
- (E) Pressure settings;
- (F) Hydraulic cylinders;

(G) Ensure that the emergency stop system is functioning properly;

(H) All controls clearly marked.

(ii) Electrical.

(A) All systems functioning properly.

(B) All remote control functions are operating properly.

Ensure that the emergency stop system is functioning properly.

(C) All controls clearly marked.

(iii) Structural.

(A) Visual inspection for cracks, corrosion, and deformations of the concrete pump with placing boom structure, and all load carrying components such as outriggers, cross frames, torsion box beams, and delivery line support structures that may lead to nondestructive testing.

(B) Visual examination of all links, pivots, pins, and bolts.

(C) Vertical and horizontal movement at the turret, turntable, rotation gear lash, bearing tolerances, not to exceed manufacturer's specifications.

(iv) Piping systems.

(A) Wall thickness must not exceed original manufacturer's specifications.

(B) Mounting hardware for attaching delivery system.

(C) Correct clamps and safety pins.

(v) Safety decals.

All safety decals shall be in place as required by the manufacturer.

(9) Concrete buckets.

(a) Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

(b) Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.

(c) Riding of concrete buckets for any purpose shall be prohibited, and vibrator crews shall be kept out from under concrete buckets suspended from cranes or cableways.

(d) When discharging on a slope, the wheels of ready-mix trucks shall be blocked and the brakes set to prevent movement.

(10) Tremies. Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials in addition to the regular couplings or connections).

(11) Bull floats. Bull float handles, used where they might contact energized electrical conductors, shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

(12) Masonry saws shall be constructed, guarded, and operated in accordance with WAC 296-155-367 (1) through (4).

(13) Lockout/tagout procedures. No employee shall be permitted to perform maintenance or repair activity on equipment (such as compressors, mixers, screens, or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged in accordance with chapter 296-155 WAC, Part I.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-155-682, filed 6/29/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and chapter 49.17 RCW. 00-21-102, § 296-155-682, filed 10/18/00, effective 2/1/01. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-682, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-682, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-682, filed 1/10/91, effective 2/12/91; 90-17-051 (Order 90-10), § 296-155-682, filed 8/13/90, effective 9/24/90; 89-11-035 (Order 89-03), § 296-155-682, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-683 Concrete finishing.** (1) Scaffolds for use of cement finishers shall comply with the requirements of chapter 296-155 WAC, Part J-1, Scaffolds.

(2) Where grinders, chippers, and other equipment is used which creates a thrust force while working on scaffolding, such scaffold shall be securely tied to a structure or held in with weighted drop lines.

(3) Grinding and dressing operations carried on within closed rooms, stairwells, elevator shafts, etc., shall be provided with forced air ventilation.

(4) Grinding machine operators shall wear respirators whenever machines are in operation or where dust hazard exists.

(5) Eye protection shall be worn by workers engaged in grinding, chipping, or sacking concrete as required by WAC 296-155-215.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-683, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-683, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-684 Requirements for cast in place concrete.** (1) General requirements for formwork.

(a) Formwork shall be designed, fabricated, erected, supported, braced, and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is designed, fabricated, erected, supported, braced, and maintained in conformance with the Appendix to this section will be deemed to meet the requirements of this subdivision.

(b) Any form, regardless of size, shall be planned in every particular and designed and constructed with an adequate factor of safety. In addition to computable loading, additional form pressures may result from impact during concrete placement, sudden lowering of temperatures retarding the set and increasing the liquid head or static pressure, vibrations of the form or concrete, uneven stressing resulting from failure or weakening of form members, or impact from concrete buckets or placing equipment. As a result, an adequate factor of safety is required to offset these unpredictable conditions.

(c) The thoroughness of planning and design shall be governed by the size, complexity, and intended use of the form. Formwork which is complex in nature or which will be subjected to unusually high concrete pressures shall be designed or approved for use by an engineer or experienced form designer.

(2) Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

(3) Shoring and reshoring.

(a) General: Shoring installations constructed in accordance with this standard shall be designed in accordance with American National Standard Recommended Practice for Concrete Formwork, ANSI-(ACI 347-78), Formwork for Concrete ACI 318-83, or with the following publications of the Scaffolding & Shoring Institute: Recommended Standard Safety Code for Vertical Shoring, 1970; Single Post Shore Safety Rules, 1969; and Steel Frame Shoring Safety, Safety Rules, 1969.

(b) All shoring equipment shall be inspected prior to erection to determine that it is as specified in the shoring layout.

(c) A shoring layout shall be prepared or approved by a person qualified to analyze the loadings and stresses which are induced during the construction process.

(d) A copy of the shoring layout shall be available at the jobsite.

(e) The shoring layout shall include all details of the specification, including unusual conditions such as heavy beams, sloping areas, ramps, and cantilevered slabs, as well as plan and elevation views.

(f) Shoring equipment found to be damaged such that its strength is reduced to less than that required by WAC 296-155-684 (1)(a) shall not be used for shoring.

(g) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.

(h) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(i) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load without settlement or displacement.

(j) All base plates, shore heads, extension devices, and adjustment screws shall be in firm contact, and secured when necessary, with the foundation and the form.

(k) Eccentric loads on shore heads and similar members shall be prohibited unless these members have been designed for such loading.

(l) The minimum total design load for any shoring used in slab and beam structures shall be not less than one hundred pounds per square foot for the combined live and dead load regardless of slab thickness; however, the minimum allowance for live load and formwork shall be not less than twenty pounds per square foot in addition to the weight of the concrete. Additional allowance for live load shall be added for special conditions other than when placing concrete for standard-type slabs and beams. Shoring shall also be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one hundred pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. (See subsection (3)(b) of this section.)

(m) When motorized carts are used, the design load shall be increased twenty-five pounds per square foot.

(4) The design stresses for form lumber and timbers shall be within the tolerance of the grade, condition, and species of lumber used.

(5) The design stresses used for form lumber and timber shall be shown on all drawings, specifications, and shoring layouts.

(6) All load-carrying timber members of scaffold framing shall be a minimum of 1500 f (stress grade) construction grade lumber. All dimensions are nominal sizes except that where rough sizes are noted, only rough or undressed lumber of the size specified shall satisfy minimum requirements.

(7) When shoring from soil, an engineer or other qualified person shall determine that the soil is adequate to support the loads which are to be placed on it.

(8) Precautions shall be taken so that weather conditions do not change the load-carrying conditions of the soil below the design minimum.

(9) When shoring from fill or when excessive earth disturbance has occurred, an engineer or other qualified person shall supervise the compaction and reworking of the disturbed area and determine that it is capable of carrying the loads which are to be imposed upon it.

(10) Suitable sills shall be used on a pan or grid dome floor or any other floor system involving voids where vertical shoring equipment could concentrate an excessive load on a thin concrete section.

(11) When temporary storage of reinforcing rods, material, or equipment on top of formwork becomes necessary, these areas shall be sufficient to meet the loads.

(12) If any deviation in the shoring plan is necessary because of field conditions, the person who prepared the shoring layout shall be consulted for approval of the actual field setup before concrete is placed.

(13) The shoring setup shall be checked to insure that all details of the layout have been met.

(14) The completed shoring setup shall be a homogenous unit or units and shall have the specified bracing to give it lateral stability.

(15) The shoring setup shall be checked to make certain that bracing specified in the shoring layout for lateral stability is in place.

(16) All vertical shoring equipment shall be plumb. Maximum allowable deviation from the vertical is one-eighth inch in three feet. If this tolerance is exceeded, the shoring equipment shall not be used until readjusted within this limit.

(17) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(18) Shoring equipment shall not be released or removed until the approval of a qualified engineer has been received.

(19) Removal of shoring equipment shall be planned so that the equipment which is still in place is not overloaded.

(20) Slabs or beams which are to be reshored should be allowed to take their actual permanent deflection before final adjustment of reshoring equipment is made.

(21) While the reshoring is underway, no construction loads shall be permitted on the partially-cured concrete.

(22) The allowable load on the supporting slab shall not be exceeded when reshoring.

(23) The reshoring shall be thoroughly checked to determine that it is properly placed and that it has the load capacity to support the areas that are being reshored.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-684, filed 7/20/94, effective 9/20/94; 89-11-035 (Order 89-03), § 296-155-684, filed 5/15/89, effective 6/30/89.]

#### **WAC 296-155-685 Tubular welded frame shoring.**

(1) Metal tubular frames used for shoring shall have allowable loads based on tests conducted according to the Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967.

(2) Design of shoring layouts shall be based on allowable loads which were obtained using the test procedures of subsection (1) of this section and on at least a two and one-half to one safety factor.

(3) All metal frame shoring equipment shall be inspected before erection.

(4) Metal frame shoring equipment and accessories shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects.

(5) All locking devices on frames and braces shall be in good working order, coupling pins shall align the frame or panel legs, pivoted cross braces shall have their center pivot in place, and all components shall be in a condition similar to that of original manufacture.

(6) When checking the erected shoring frames with the shoring layout, the spacing between towers and cross-brace spacing shall not exceed that shown on the layout, and all locking devices shall be in the closed position.

(7) Devices for attaching the external lateral stability bracing shall be securely fastened to the legs of the shoring frames.

(8) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material, and shall be snug against the legs of the frames.

(9) Eccentric loads on shore heads and similar members shall be prohibited unless the shore heads have been designed for such loading.

(10) When formwork is installed at an angle, or sloping, or when the surface shored from is sloping, the shoring shall be designed for such loading.

(11) Adjustment screws shall not be adjusted to raise formwork after the concrete is in place.

[Statutory Authority: Chapter 49.17 RCW, 89-11-035 (Order 89-03), § 296-155-685, filed 5/15/89, effective 6/30/89; Order 74-26, § 296-155-685, filed 5/7/74, effective 6/6/74.]

#### **WAC 296-155-686 Tube and coupler shoring.**

(1) Tube and coupler towers used for shoring shall have allowable loads based on tests conducted according to the Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967.

(2) Design of shoring layouts shall be based on working loads which were obtained using the test procedures of subsection (1) of this section and on at least a two and one-half to one safety factor.

(3) All tube and coupler components shall be inspected before being used.

(4) Tubes of shoring structures shall not be used if heavily rusted, bent, dented, or having other defects.

(5) Couplers (clamps) shall not be used if deformed, broken, or having defective or missing threads on bolts, or other defects.

(6) The material used for the couplers (clamps) shall be of a structural type such as drop-forged steel, malleable iron, or structural grade aluminum. Gray cast iron shall not be used.

(7) When checking the erected shoring towers with the shoring layout, the spacing between posts shall not exceed that shown on the layout, and all interlocking of tubular members and tightness of couplers should be checked.

(8) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material, and shall be snug against the posts.

(9) Eccentric loads on shore heads and similar members shall be prohibited unless the shore heads have been designed for such loading.

(10) Special precautions shall be taken when formwork is at angles, or sloping, or when the surface shored from is sloping.

(11) Adjustment screws shall not be adjusted to raise formwork after the concrete is in place.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-686, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-687 Single post shores.** (1) When checking erected single post shores with the shoring layout, the spacing between shores in either direction shall not exceed that shown on the layout, and all clamps, screws, pins, and all other components shall be in the closed or engaged position.

(2) For stability, single post shores shall be horizontally braced in both the longitudinal and transverse directions. Diagonal bracing shall also be installed. Such bracing shall be installed as the shores are being erected.

(3) Devices which attach to the external lateral stability bracing shall be securely fastened to the single post shores.

(4) All baseplates or shore heads of single post shores shall be in firm contact with the footing sill and the form material.

(5) Whenever single post shores are used in more than one tier, the layout shall be designed and inspected by a structural engineer.

(6) Eccentric loads on shore heads shall be prohibited unless the shore heads have been designed for such loading.

(7) When formwork is at an angle, or sloping, or when the surface shored from is sloping, the shoring shall be designed for such loading.

(8) Adjustment of single post shores to raise formwork shall not be made after concrete is in place.

(9) Respecting fabricated single post shores, the following shall apply:

(a) The clamp used for adjustable timber single post shores shall have working load ratings based on tests conducted according to the standard test procedures for fabricated single post shores in Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967, and on at least a three to one safety factor.

(b) Shoring layouts shall be made using working loads which were obtained using the test procedures of (a) of this subsection, and on at least a three to one safety factor.

(c) All fabricated single post shores shall be inspected before being used.

(d) Fabricated single post shores shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects. If they contain timber, they shall not be used if timber is split, cut, has sections removed, is rotted, or otherwise structurally damaged.

(e) All clamps, screws, pins, threads, and all other components shall be in a condition similar to that of original manufacture.

(10) Respecting adjustable timber single post shores, the following shall apply:

(a) The clamp used for adjustable timber single post shores shall have working load ratings based on tests conducted according to the standard test procedures for fabricated single post shores in Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967, and on at least a three to one safety factor.

(b) Timber used shall have the safety factor and allowable working load for each grade and species as recommended in the Tables for wooden columns in the Wood Structural Design Data Book, National Forest Products Association, 1970.

(c) The shoring layout shall be made using the allowable load obtained by using the test procedure for the clamp or Tables for timber referred to in (a) and (b) of this subsection.

(d) All timber and adjusting devices to be used for adjustable timber single post shores shall be inspected before erection.

(e) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

(f) Adjusting devices shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects.

(g) All nails used to secure bracing on adjustable timber single post shores shall be driven home and the point of the nail bent over.

(11) Respecting timber single post shores, the following shall apply:

(a) Timber used as single post shores shall have the safety factor and allowable working load for each grade and species as recommended in the Tables for wooden columns in the Wood Structural Design Data Book, National Forest Products Association, 1970.

(b) The shoring layout shall be prepared by using working loads obtained by using the Tables referred to in (a) of this subsection.

(c) All timber to be used for single post shoring shall be inspected before erection.

(d) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

(e) All nails used to secure bracing on timber single post shores shall be driven home and the point of the nail bent over.

(12) Tiered single post shores. Whenever single post shores are used one on top of another (tiered), the employer

shall comply with the following specific requirements in addition to the general requirements for formwork:

(a) The design of the shoring shall be prepared by a qualified designer and the erected shoring shall be inspected by an engineer qualified in structural design.

(b) The single post shores shall be vertically aligned.

(c) The single post shores shall be spliced to prevent misalignment.

(d) The single post shores shall be adequately braced in two mutually perpendicular directions at the splice level. Each tier shall also be diagonally braced in the same two directions.

(e) Adjustment of single post shores to raise formwork shall not be made after the placement of concrete.

(f) Reshoring shall be erected, as the original forms and shores are removed, whenever the concrete is required to support loads in excess of its capacity.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-687, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-688 Vertical slip forms.** (1) Slip forms shall be designed and constructed, and the form movement carried out, under the immediate supervision of a person or persons experienced in slip form design and operation. Drawings prepared by a qualified engineer, showing the jack layout, formwork, working decks, and scaffolding, shall be available at the jobsite, and followed.

(2) The steel rods or pipe on which the jacks climb or by which the forms are lifted shall be designed for this purpose. Such rods must be adequately braced where not encased in concrete.

(3) Forms shall be designed to prevent excessive distortion of the structure during the jacking operation.

(4) All vertical slip forms shall be provided with scaffolding or work platforms completely encircling the area of placement.

(5) Jacks and vertical supports shall be positioned in such a manner that the loads do not exceed the rated capacity of the jacks.

(6) The jacks or other lifting devices shall be provided with mechanical dogs or other automatic holding devices to support the slip forms whenever failure of the power supply or lifting mechanism occurs.

(7) The form structure shall be maintained within all design tolerances specified for plumbness during the jacking operation.

(8) Lifting shall proceed steadily and uniformly and shall not exceed the predetermined safe rate of lift. A jacking system, which provides precise, simultaneous movement of the entire form in small preselected increments, is recommended for large structures.

(9) Workers placing reinforcing steel shall comply with the requirements of chapter 296-155 WAC, Part C-1 when working above the scaffold level.

(10) The total allowable load on slip form platforms shall be determined by the design engineer and enforced by the field supervisor.

(11) Lateral and diagonal bracing of the forms shall be provided to prevent excessive distortion of the structure during the sliding operation.

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(12) While the slide is in operation, the form structure shall be maintained in line and plumb.

(13) A field supervisor experienced in slip form construction shall be present on the deck at all times.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-688, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-688, filed 1/10/91, effective 2/12/91; 89-11-035 (Order 89-03), § 296-155-688, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-689 Placing and removal of forms.** (1) When moved or raised by crane, cableway, A-frame, or similar mechanical device, forms shall be securely attached to slings having a minimum safety factor of five. Use of No. 9 tie wire, fiber rope, and similar makeshift lashing shall be prohibited.

(2) Taglines shall be used in moving panels or other large sections of forms by crane or hoist.

(3) All hoisting equipment, including hoisting cable used to raise and move forms shall have a minimum safety factor incorporated in the manufacturer's design, and the manufacturer's recommended loading shall not be exceeded. Field-fabricated or shop-fabricated hoisting equipment shall be designed or approved by a registered professional engineer, incorporating a minimum safety factor of five in its design. Panels and built-up form sections shall be equipped with metal hoisting brackets for attachment of slings.

(4) Forms intended for use where there is a free fall of over ten feet shall be equipped with adequate scaffolding and guardrails, or employees working on the forms shall be protected from falls in accordance with chapter 296-155 WAC, Part C-1 during forming and stripping operations.

(5) Vertical forms being raised or removed in sections shall not be released until adequately braced or secured. Overhead forms shall not be released until adequately braced or secured.

(6) Workers or others at lower levels shall be protected from falling materials. Appropriate warning signs shall be erected along walkways.

(7) Forms shall not be removed until the concrete is cured. The concrete shall be adequately set in order to permit safe removal of the forms, shoring, and bracing. Engineer's specifications and local building codes shall be adhered to in determining the length of time forms should remain in place following concrete placement. In addition, tests shall be made on field-cured concrete specimens in order to insure that concrete has obtained sufficient strength to safely support the load prior to removal of forms.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-689, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-689, filed 1/10/91, effective 2/12/91; 89-11-035 (Order 89-03), § 296-155-689, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-690 Appendix to WAC 296-155-684 cast in place concrete.** General requirements for formwork.

(This Appendix is nonmandatory.)

This Appendix serves as a nonmandatory guideline to assist employers in complying with the formwork requirements in WAC 296-155-684 (1)(a). Formwork which has been designed, fabricated, erected, braced, supported, and maintained in accordance with Sections 6 and 7 of the Amer-

ican National Standard for Construction and Demolition Operations-Concrete and Masonry Work, ANSI A10.9-1983, shall be deemed to be in compliance with the provision of WAC 296-155-684 (1)(a).

[Statutory Authority: Chapter 49.17 RCW. 90-03-029 (Order 89-20), § 296-155-690, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-690, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-690, filed 1/21/86; Order 74-26, § 296-155-690, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-691 Precast concrete and tilt-up operations.** (1) It shall be the responsibility of the contractor to use accessories which are designed to be compatible.

(2) The design capacity of all lifting devices and accessories shall be known. The devices and accessories with the appropriate capacity shall be used.

(3) Prior to pouring the panels of a tilt-up type construction job, a set of plans or job specifications, including lifting procedures, shall be drawn up.

(a) These plans shall be at the job site and made available upon request.

(b) Any changes made in the rigging procedure of a tilt-up panel or slab shall provide the same degree of safety as required by the original plans.

(c) The plans or specifications shall contain the following information:

- (i) The type, size, and location of all lifting inserts.
- (ii) The type, size, and location of all brace inserts or fittings for guy wires in each panel and floor or support.
- (iii) The size of braces or guys to be used.
- (iv) The compression strength which concrete panels must attain prior to being lifted.

(4) The following conditions shall be included in the erection process and shall be incorporated in the design plan:

(a) Braces and all associated components of the bracing system shall be designed to incorporate a safety factor of one and one-half to resist any normal stresses to which they may be subjected, including normal high wind velocity pressures for the area.

(b) Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

(c) Floor braces used to secure panel sections shall be placed at an angle of not less than forty-five degrees or more than sixty degrees from horizontal when physically possible to install in this manner.

(d) The bracing on all panel sections shall be installed in such a manner as to prevent the panel from accidentally rotating.

(e) Each panel section not secured by other means shall have a minimum of two braces. The braces shall be installed in such a manner as to evenly distribute the load or guy wires, when properly installed, may be used in lieu of stiff leg braces.

(f) If braces are attached to a panel or slab by bolts tightened into inserts installed in holes drilled in concrete, the type of inserts used and method of installation shall be such as to develop the required strength to be maintained for the bracing system.

(g) Inserts to be installed for lifting sections of tilt-up precast panels shall be designed mechanically to maintain a safety factor of three.

(h) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(i) The compression strength of the concrete shall be such that when the proper type, size, and amount of inserts are installed a minimum safety factor of two will be maintained.

(j) Lifting hardware shall be capable of supporting at least five times the maximum intended load applied or transmitted to the lifting hardware.

(k) Lifting bolts or other lifting devices which have been bent, worn, or are defective shall be discarded.

(l) The upper and lower sections of telescoping type braces shall be secured by high tensile steel pins or bolts which provide adequate shear strength and which will positively secure against accidental removal.

(m) Manufactured products shall not be altered in a manner which would reduce the safe working load to less than its original value.

(n) Inserts shall be positioned so that bolts, or lifting devices, when inserted, will be perpendicular to the face on which they are placed.

(5) Design of the panels and layout of the pour shall be made in such a manner so that when picking, the top of the panel will be away from the crane. If this is not possible, the contractor shall consult with a representative of the department and the crane company involved to determine the procedure to be followed in lifting and placing in its permanent position safely. Panels shall be lifted and handled in such a manner that they will not strike the hoisting equipment, in case of failure.

(a) Physical stops shall be provided which will prevent the bottom edge of a panel being set from slipping off the edge of its supporting structure.

(b) Tilt-up panels shall not be set when there is a possibility that wind velocity would create a hazardous condition.

(c) A qualified signalperson shall be designated and shall consult with the crane operator on lifting procedures prior to making the pick. The signalperson shall be located in such a position during the pick of the panel that they can observe both the crane operator and the employees working in the immediate area.

(d) During the lifting process, workers shall keep clear of the under side of the panel.

(e) Persons not involved in the lifting process shall be kept clear of the hazardous area near where panels are being raised, moved or placed.

(f) If braces must be removed temporarily during construction, other effective means shall be provided to safely support the panel during the interim period.

(g) Each panel shall be properly braced or otherwise secured prior to removal of the hoisting equipment.

(h) Short panels or sections not otherwise supported by floor, footings, columns or other structure, shall be properly shored.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-691, filed 7/20/94, effective 9/20/94; 90-17-051 (Order 90-10), § 296-

155-691, filed 8/13/90, effective 9/24/90; 89-11-035 (Order 89-03), § 296-155-691, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-694 Requirements for lift-slab construction operations.** (1) Lift-slab operations shall be designed and planned by a registered professional engineer who has experience in lift-slab construction. Such plans and designs shall be implemented by the employer and shall include detailed instructions and sketches indicating the prescribed method of erection. These plans and designs shall also include provisions for ensuring lateral stability of the building/structure during construction.

(2) Jacks/lifting units shall be marked to indicate their rated capacity as established by the manufacturer.

(3) Jacks/lifting units shall not be loaded beyond their rated capacity as established by the manufacturer.

(4) Jacking equipment shall be capable of supporting at least two and one-half times the load being lifted during jacking operations and the equipment shall not be overloaded. For the purpose of this provision, jacking equipment includes any load bearing component which is used to carry out the lifting operation(s). Such equipment includes, but is not limited to, the following: Threaded rods, lifting attachments, lifting nuts, hook-up collars, T-caps, shearheads, columns, and footings.

(5) Jacks/lifting units shall be designed and installed so that they will neither lift nor continue to lift when they are loaded in excess of their rated capacity.

(6) Jacks/lifting units shall have a safety device installed which will cause the jacks/lifting units to support the load in any position in the event any jack/ lifting unit malfunctions or losses [loses] its lifting ability.

(7) Jacking operations shall be synchronized in such a manner to ensure even and uniform lifting of the slab. During lifting, all points at which the slab is supported shall be kept within 1/2 inch of that needed to maintain the slab in a level position.

(8) If leveling is automatically controlled, a device shall be installed that will stop the operation when the 1/2 inch tolerance set forth in subsection (7) of this section is exceeded or where there is a malfunction in the jacking (lifting) system.

(9) If leveling is maintained by manual controls, such controls shall be located in a central location and attended by a competent person while lifting is in progress. In addition to meeting the definition in WAC 296-155-012(4), the competent person must be experienced in the lifting operation and with the lifting equipment being used.

(10) The maximum number of manually controlled jacks/ lifting units on one slab shall be limited to a number that will permit the operator to maintain the slab level within specified tolerances of subsection (7) of this section, but in no case shall that number exceed 14.

(11) No employee, except those essential to the jacking operation, shall be permitted in the building/structure while any jacking operation is taking place unless the building/ structure has been reinforced sufficiently to ensure its integrity during erection. The phrase "reinforced sufficiently to ensure its integrity" used in this subsection means that a registered professional engineer, independent of the engineer who designed and planned the lifting operation, has determined from the plans that if there is a loss of support at

any jack location, that loss will be confined to that location and the structure as a whole will remain stable.

(a) Under no circumstances, shall any employee who is not essential to the jacking operation be permitted immediately beneath a slab while it is being lifted.

(b) For the purpose of subsection (11) of this section, a jacking operation begins when a slab or group of slabs is lifted and ends when such slabs are secured (with either temporary connections or permanent connections).

(c) Employers who comply with Appendix A to WAC 296-155-694 shall be considered to be in compliance with the provisions of subsections (11) through (11)(c) of this section.

(12) When making temporary connections to support slabs, wedges shall be secured by tack welding, or an equivalent method of securing the wedges to prevent them from falling out of position. Lifting rods may not be released until the wedges at that column have been secured.

(13) All welding on temporary and permanent connections shall be performed by a certified welder, familiar with the welding requirements specified in the plans and specifications for the lift-slab operation.

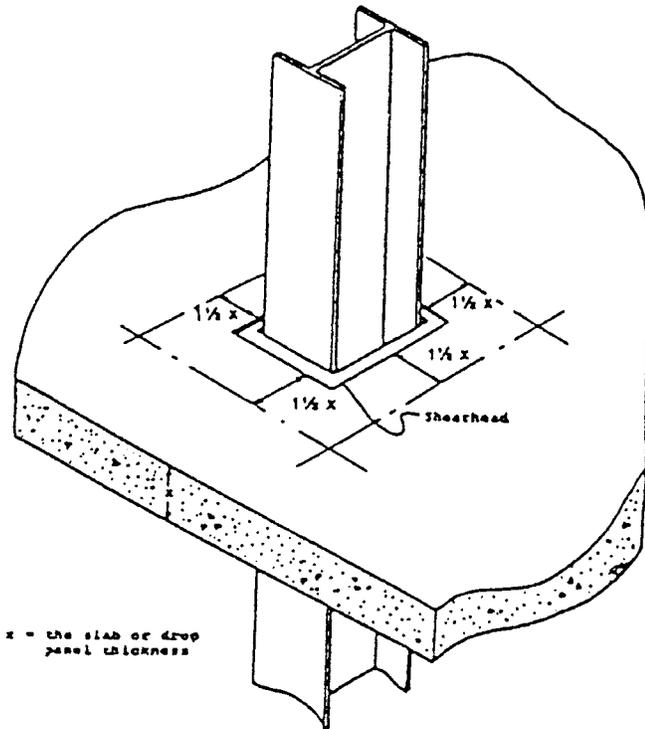
(14) Load transfer from jack/lifting units to building columns shall not be executed until the welds on the column shear plates (weld blocks) are cooled to air temperature.

(15) Jacks/lifting units shall be positively secured to building columns so that they do not become dislodged or dislocated.

(16) Equipment shall be designed and installed so that the lifting rods cannot slip out of position or the employer shall institute other measures, such as the use of locking or blocking devices, which will provide positive connection between the lifting rods and attachments and will prevent components from disengaging during lifting operations.

Appendix to WAC 296-155-694—Lift-slab operations  
(This appendix is nonmandatory.)

In WAC 296-155-694(11), WISHA requires employees to be removed from the building/structure during jacking operations unless an independent registered professional engineer, other than the engineer who designed and planned the lifting operation, has determined that the building/ structure has been sufficiently reinforced to insure the integrity of the building/structure. One method to comply with this provision is for the employer to ensure that continuous bottom steel is provided in every slab and in both directions through every wall or column head area. (Column head area means the distance between lines that are one and one half times the thickness of the slab or drop panel. These lines are located outside opposite faces of the outer edges of the shearhead sections—See Figure 1.) The amount of bottom steel shall be established by assuming loss of support at a given lifting jack and then determining the steel necessary to carry, by catenary action over the span between surrounding supports, the slab service dead load plus any service dead and live loads likely to be acting on the slab during jacking. In addition, the surrounding supports must be capable of resisting any additional load transferred to them as a result of the loss of support at the lifting jack considered.



**Figure 1—Column Head Area**

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-694, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-155-694, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-155-694, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-694, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-695 Miscellaneous concrete construction.** (1) General provisions.

(a) Deadheads used in post tensioning of tendons shall be the type that will increase the grip on the cable as the tension is increased.

(b) Proper means and equipment shall be used to prevent the over-tensioning of the tendons.

(c) Only qualified workers shall perform this type work.

(2) Prestressed and poststressed concrete operations.

(a) Anchor fitting. In utilizing anchor fittings for tensioned strands, the recommendations and instructions of the supplier concerning installation, maintenance, and replacement shall be followed.

(b) Tools and strand vices shall be kept clean and in good repair.

(c) Safety factor.

(i) Expendable strand deflection devices used to pretension concrete members shall have a minimum safety factor of two.

(ii) Reusable strand deflection devices shall have a minimum safety factor of three.

(d) Jacking operations.

(i) During jacking operations of any tensioning element or group of tensioning elements, the anchors shall be kept turned up close to the anchorplate.

(ii) No one shall be permitted to stand in line or directly over the jacking equipment during tensioning operations.

(iii) Employees shall not stand behind the jack during tensioning operations.

(e) Jacking and pulling equipment. Pulling headers, bolts, and hydraulic rams shall be frequently inspected for indication of fatigue, and the threads on bolts and nuts inspected for diminishing cross section.

(f) Storage. Stressed members shall be stored on a level base and adequately supported during storage and transportation to prevent tipping.

(g) Rigging.

(i) Stressed members shall be handled at pick points specifically designated on the manufacturer's drawings.

(ii) Stressed members shall be lifted with lifting devices recommended by the manufacturer or the engineer in charge.

(iii) No one shall be allowed under stressed members during lifting and erection.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-695, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-695, filed 1/21/86; Order 74-26, § 296-155-695, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-697 Requirements for masonry construction.** (1) A limited access zone shall be established whenever a masonry wall is being constructed. The limited access zone shall conform to the following:

(2) The limited access zone shall be established prior to the start of construction of the wall.

(3) The limited access zone shall be equal to the height of the wall to be constructed plus four feet, and shall run the entire length of the wall.

(4) The limited access zone shall be established on the side of the wall which will be unscaffolded.

(5) The limited access zone shall be restricted to entry by employees actively engaged in constructing the wall. No other employees shall be permitted to enter the zone.

(6) The limited access zone shall remain in place until the wall is adequately supported to prevent overturning and to prevent collapse unless the height of wall is over eight feet, in which case, the limited access zone shall remain in place until the requirements of subsection (7) of this section have been met.

(7) All masonry walls over eight feet in height shall be adequately braced to prevent overturning and to prevent collapse unless the wall is adequately supported so that it will not overturn or collapse. The bracing shall remain in place until permanent supporting elements of the structure are in place.

(8) Employees engaged in cutting or chipping shall wear suitable eye protection in accordance with WAC 296-155-215.

(9) Masonry saws shall be constructed, guarded and operated in accordance with WAC 296-155-367 (1) through (4).

(10) Persons charged with operation of derricks used for stone setting shall be qualified in that type of work.

(11) Stone shall be set directly on the wall by the derrick.

(12) Breast derricks when used in setting stone shall be secured against a slip or kick back and guyed with wire cables. Provide hold down line to prevent derrick from falling back.

(13) Stone cutters shall wear goggles while trimming stone or cutting holes.

(14) Pins shall be tested for security before stone is hoisted.

(15) Hoisting cables shall be protected from chafing and wearing over corners.

(16) Mason's mortar mixers shall have a bar-type grill installed over the mixer opening. The guard shall be installed with an automatic disconnect switch to stop the mixer tub rotation and prevent the mixer from starting whenever the guard is not in place.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-155-697, filed 8/13/90, effective 9/24/90; 90-03-029 (Order 89-20), § 296-155-697, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-697, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-699 Appendix A to Part O—References to Part O of chapter 296-155 WAC.** (This Appendix is nonmandatory.)

The following nonmandatory references provide information which can be helpful in understanding and complying with the requirements contained in Part O.

- Accident Prevention Manual for Industrial Operations; Eighth Edition; National Safety Council.
- Building Code Requirements for Reinforced Concrete (ACI 318-83).
- Formwork for Concrete (ACI SP-4).
- Recommended Practice for Concrete Formwork (ACI 347-78).
- Safety Requirements for Concrete and Masonry Work (ANSI A10.9-1983).
- Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens (ASTM C39-86).
- Standard Test Method for Making and Curing Concrete Test Specimens in the Field (ASTM C31-85).
- Standard Test Method for Penetration Resistance of Hardened Concrete (ASTM C803-82).
- Standard Test Method for Compressive Strength of Concrete Cylinders Cast In-Place in Cylindrical Molds (ASTM C873-85).
- Standard Method for Developing Early Age Compressive Test Values and Projecting Later Age Strengths (ASTM C918-80).
- Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction (ASTM E329-77).
- Method of Making and Curing Concrete Test Specimens in the Laboratory (ASTM C192-88).
- Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete (ASTM C42-87).
- Methods of Securing, Preparing and Testing Specimens from Hardened Lightweight Insulating Concrete for Compressive Strength (ASTM C513-86).
- Test Method for Comprehensive Strength of Lightweight Insulating Concrete (ASTM C495-86).
- Method of Making, Accelerating Curing, and Testing of Concrete Compression Test Specimens (ASTM C684-81).
- Test Method for Compressive Strength of Concrete Using Portions of Beams Broken in Flexure (ASTM C116-68 (1980)).

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[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-699, filed 7/20/94, effective 9/20/94; 89-11-035 (Order 89-03), § 296-155-699, filed 5/15/89, effective 6/30/89.]

**PART P  
STEEL ERECTION**

**WAC 296-155-701 Scope.** (1)(a) This part applies to employers involved in the construction, alteration and repair of single or multistory buildings, bridges, and a variety of other structures. This part applies to employers involved in steel erection unless specifically excluded.

(b) Examples of steel erection structures include, but are not limited to:

Aerialways;	Aerospace facilities and structures;
Air and cable supported structures;	Amphitheaters;
Amusement park structures and rides;	Aqueducts;
Artistic and monumental structures;	Atriums;
Auditoriums;	Balconies;
Billboards;	Bins;
Bridges;	Canopies;
Car dumpers;	Catwalks;
Chemical process structures;	Conveyor supports and related framing;
Conveyor systems;	Cranes and craneways;
Curtain walls;	Draft curtains;
Elevator fronts;	Energy exploration structures;
Energy production, transfer and storage structures and facilities;	Entrances;
Fire containment structures;	Fire escapes;
Furnaces;	Geodesic domes;
Hi-bay structures;	Hoppers;
Industrial structures;	Lift slab/tilt-up structures;
Light towers;	Malls;
Metal roofs;	Mills;
Monorails;	Ovens;
Overpasses;	Penthouses;
Platforms;	Power plants;
Racks and rack support structures and frames;	Radar and communication structures;
Rail, marine and other transportation structures;	Scoreboards;
Signage;	Single and multistory buildings;
Skylights;	Sound barriers;
Space frames;	Stackers/reclaimers;
Stacks;	Stadiums;
Stair towers;	Stairways;
Store fronts;	Systems-engineered metal buildings;
Trestles;	Underpasses;
Viaducts;	Water process and water containment structures; and
Window walls.	

(2)(a) Covered steel erection work includes the:

- Hoisting, laying out, placing, connecting, welding, burning, guying, bracing, bolting, plumbing and rigging of structural steel, steel joists, and metal buildings; and
- Installing metal decking, curtain walls, window walls, siding systems, miscellaneous metals, ornamental iron and similar materials.

(b) The following work is also covered by this part when done during, and are a part of, steel erection work:

Anchoring devices;	Building equipment;
Building specialties;	Cable stays;
Castings;	Cold formed steel framing;
Column covers;	Conveying systems;
Crane rails and accessories;	Detention or security equipment and doors, windows and hardware;

Doors; windows;	Elevator beams;
Enclosures and pockets;	Falsework for temporary supports of permanent steel members;
Fascias;	Fences and gates;
Ferrous metals and alloys;	Floor plates;
Gaskets;	Glass;
Gratings;	Grillage;
Handrails;	Hardware;
Hydraulic structures;	Joint fillers;
Ladders;	Louvers;
Metal decking and raceway systems and accessories;	Metal panels and panel wall systems;
Metal roofing and accessories;	Metal siding; bridge flooring;
Miscellaneous, architectural and ornamental metals and metal work;	Multipurpose supports;
Nonferrous metals and alloys;	Ornamental iron work, expansion control including bridge expansion joint assemblies;
Penthouse enclosures;	Perforated metals;
Permanent and temporary bents and towers;	Plastics and synthetic composite materials;
Railings;	Rigging, hoisting, laying out, placing, connecting, guying, bracing, dismantling, burning, welding, bolting, grinding, sealing, caulking, and all related activities for construction, alteration and/or repair of materials and assemblies such as structural steel;
Safety systems for steel erection;	Sealants and seals;
Sheet metal fabrications;	Shelf racks;
Skylights;	Slide bearings;
Soffit panels;	Stairs;
Steel and metal joists;	Stone and other nonprecast concrete architectural materials mounted on steel frames;
Structural cabling;	Structural metal framing and related bracing and assemblies; and
Trench covers.	

(3) Controlling contractor duties are specified in WAC 296-155-703 (1) and (3), 296-155-707 (2)(b), 296-155-714(2), and 296-155-716(5).

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-701, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-702 Definitions. Anchored bridging** means that the steel joist bridging is connected to a bridging terminus point.

**Bolted diagonal bridging** means diagonal bridging that is bolted to a steel joist or joists.

**Bridging clip** means a device that is attached to the steel joist to allow the bolting of the bridging to the steel joist.

**Bridging terminus point** means a wall, a beam, tandem joists (with all bridging installed and a horizontal truss in the plane of the top chord) or other element at an end or intermediate point(s) of a line of bridging that provides an anchor point for the steel joist bridging.

**Choker** means a wire rope or synthetic fiber rigging assembly that is used to attach a load to a hoisting device.

**Cold forming** means the process of using press brakes, rolls, or other methods to shape steel into desired cross sections at room temperature.

**Column** means a load-carrying vertical member that is part of the primary skeletal framing system. Columns do not include posts.

**Competent person** (also defined in WAC 296-155-012) means one who can identify existing or predictable hazards in the surroundings or working conditions which are unsanitary,

hazardous, or dangerous to employees, and who has authorization or authority by nature of their position to take prompt corrective measures to eliminate them. The person must be knowledgeable of the requirements of this part.

**Connector** means someone who, working with hoisting equipment, is placing and connecting structural members and/or components.

**Constructibility** means the ability to erect structural steel members in accordance with this part without having to alter the overall structural design.

**Construction load** (for joist erection) means any load other than the weight of the employee(s), the joists and the bridging bundle.

**Controlled load-lowering** means lowering a load by means of a mechanical hoist drum device that allows a load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.

**Controlling contractor** means a prime contractor, general contractor, construction manager or any other legal entity that has the overall responsibility for the construction of the project—its planning, quality and completion.

**Critical lift** means a lift that:

- Exceeds seventy-five percent of the crane or derrick rated load chart capacity; or

- Requires the use of more than one crane or derrick.

**Derrick floor** means an elevated floor of a building or structure that has been designated to receive hoisted pieces of steel prior to final placement.

**Double connection** means an attachment method where the connection point is intended for two pieces of steel that share common bolts on either side of a central piece.

**Double connection seat** means a structural attachment that, during the installation of a double connection, supports the first member while the second member is connected.

**Employee** (and other terms of like meaning, unless the context of the provision containing such a term indicates otherwise) means an employee of an employer who is employed in the business of his or her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is personal labor for an employer under this standard whether by way of manual labor or otherwise.

**Employer** means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: Provided, That any persons, partnership, or business entity not having employees, and who is covered by the Industrial Insurance Act must be considered both an employer and an employee.

**Erection bridging** means the bolted diagonal bridging that is required to be installed prior to releasing the hoisting cables from the steel joists.

**Final interior perimeter** means the perimeter of a large permanent open space within a building such as an atrium or courtyard. This does not include openings for stairways, elevator shafts, etc.

**Floor hole (decking hole)** means an opening measuring less than twelve inches but more than one inch in its least dimension in any floor, roof, or platform through which materials but not persons may fall, such as a belt hole, pipe opening, or slot opening.

**Girt** (in systems-engineered metal buildings) means a "Z" or "C" shaped member formed from sheet steel spanning between primary framing and supporting wall material.

**Headache ball** means a weighted hook that is used to attach loads to the hoist load line of the crane.

**Hoisting equipment** means lifting equipment designed to lift and position a load of known weight to a location at some known elevation and horizontal distance from the equipment's center of rotation. Hoisting equipment includes, but not limited to:

- Cranes;
- Derricks;
- Tower cranes;
- Barge-mounted derricks or cranes;
- Gin poles; and
- Gantry hoist systems.

Note: A come-a-long (a mechanical device, usually consisting of a chain or cable attached at each end, that is used to facilitate movement of materials through leverage) is not considered hoisting equipment.

**Metal decking** means a commercially manufactured, structural grade, cold rolled metal panel formed into a series of parallel ribs and includes metal floor and roof decks, standing seam metal roofs, other metal roof systems and other products such as bar gratings, checker plate, expanded metal panels, and similar products. After installation and proper fastening, these decking materials serve a combination of functions including: A structural element designed in combination with the structure to resist, distribute and transfer loads, stiffen the structure and provide a diaphragm action; a walking/working surface; a form for concrete slabs; a support for roofing systems; and a finished floor or roof.

**Multiple lift rigging** means a rigging assembly manufactured by wire rope rigging suppliers that facilitates the attachment of up to five independent loads to the hoist rigging of a crane.

**Must** means mandatory.

**Permanent floor** means a structurally completed floor at any level or elevation (including slab on grade).

**Post** means a structural member with a longitudinal axis that is essentially vertical, that:

- Weighs three hundred pounds or less and is axially loaded (a load presses down on the top end); or
- Is not axially loaded, but is laterally restrained by the above member. Posts typically support stair landings, wall framing, mezzanines and other substructures.

**Project structural engineer of record** means the registered, licensed professional responsible for the design of structural steel framing and whose seal appears on the structural contract documents.

**Purlin** (in systems-engineered metal buildings) means a "Z," "C," or "W" shaped member formed from sheet steel

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spanning between primary framing and supporting roof material.

**Qualified person** means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

**Safety deck attachment** means an initial attachment that is used to secure an initially placed sheet of decking to keep proper alignment and bearing with structural support members.

**Shear connector** means headed steel studs, steel bars, steel lugs, and similar devices which are attached to a structural member for the purpose of achieving composite action with concrete.

**Steel erection** means the construction, alteration or repair of steel buildings, bridges and other structures, including the installation of metal decking and all planking used during the process of erection.

**Steel joist** means an open web, secondary load-carrying member of one hundred forty-four feet (43.9 m) or less, designed by the manufacturer, used for the support of floors and roofs. This does not include structural steel trusses or cold-formed joists.

**Steel joist girder** means an open web, primary load-carrying member, designed by the manufacturer, used for the support of floors and roofs. This does not include structural steel trusses.

**Steel truss** means an open web member designed of structural steel components by the project structural engineer of record. For the purposes of this subpart, a steel truss is considered equivalent to a solid web structural member.

**Structural steel** means a steel member, or a member made of a substitute material (such as, but not limited to, fiberglass, aluminum or composite members). These members include, but are not limited to, steel joists, joist girders, purlins, columns, beams, trusses, splices, seats, metal decking, girts, and all bridging, and cold formed metal framing which is integrated with the structural steel framing of a building.

**Systems-engineered metal building** means a metal, field-assembled building system consisting of framing, roof and wall coverings. Typically, many of these components are cold-formed shapes. These individual parts are fabricated in one or more manufacturing facilities and shipped to the job site for assembly into the final structure. The engineering design of the system is normally the responsibility of the systems-engineered metal building manufacturer.

**Tank** means a container for holding gases, liquids or solids.

**You** means the employer.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-702, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-703 Site layout, site-specific erection plan and construction sequence.** (1) Before steel erection work can start the controlling contractor must ensure the steel erector is provided written notifications that:

- (a) The concrete in the footings, piers and walls and the mortar in the masonry piers and walls has attained either:

- Seventy-five percent of the intended minimum compressive design strength; or
- Sufficient strength to support the loads imposed during steel erection.

The basis of these measurements is the appropriate ASTM standard test method of field cured samples.

(b) Any repairs, replacements and modifications to the anchor bolts were done per WAC 296-155-707(2).

(2) The steel erector must receive written notice that the concrete in the footings, piers and walls or the mortar in the masonry piers and walls has attained, on the basis of an appropriate ASTM standard test method of field-cured samples, either seventy-five percent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.

(3) **Site layout.** The controlling contractor must ensure that the following is provided and maintained:

(a) Adequate access roads into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material to be erected and means and methods for pedestrian and vehicular control.

Exception: This requirement does not apply to roads outside the construction site.

(b) A firm, properly graded, drained area, readily accessible to the work with adequate space for the safe storage of materials and the safe operation of the erector's equipment.

(4) **Preplanning of overhead hoisting operations.** All hoisting operations in steel erection must be preplanned to ensure that the requirements of WAC 296-155-704(4) are met.

(5) **Site-specific erection plan.** Where employers elect, due to conditions specific to the site, to develop alternate means and methods that provide employee protection in accordance with WAC 296-155-704 (3)(e), 296-155-709 (1)(d) or (5)(d), a site-specific erection plan must be developed by a qualified person and be available at the worksite. Guidelines for establishing a site-specific erection plan are contained in Appendix A to this part.

(6) Steel erection must be done under the supervision of a competent person who is present at the worksite.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-703, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-704 Hoisting and rigging.** (1) All the provisions of WAC 296-155-525 and 296-155-526 apply to hoisting and rigging.

(2) In addition, subsections (3) through (5) of this section apply regarding the hazards associated with hoisting and rigging.

(3) **General.**

(a) Crane preshift visual inspection.

(i) Cranes being used in steel erection activities must be visually inspected prior to each shift by a competent person. The inspection must include observation for deficiencies during operation and, as a minimum, must include:

- All control mechanisms for maladjustments;
- Control and drive mechanism for excessive wear of components and contamination by lubricants, water or other foreign matter;

• Safety devices, including boom angle indicators, boom stops, boom kick out devices, anti-two block devices, and load moment indicators where required;

• Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation;

• Hooks and latches for deformation, chemical damage, cracks, or wear;

• Wire rope reeving for compliance with hoisting equipment manufacturer's specifications;

• Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, or moisture accumulation;

• Hydraulic system for proper fluid level;

• Tires for proper inflation and condition;

• Ground conditions around the hoisting equipment for proper support, including ground settling under and around outriggers, ground water accumulation, or similar conditions;

• The hoisting equipment for level position; and

• The hoisting equipment for level position after each move and setup.

(ii) If any deficiency is identified, an immediate determination must be made by the competent person if the deficiency constitutes a hazard.

(iii) If the deficiency constitutes a hazard, the hoisting equipment must be removed from service until the deficiency has been corrected.

(iv) The operator is responsible for those operations under their direct control. Whenever there is any doubt as to safety, the operator must have the authority to stop and refuse to handle loads until safety has been assured.

(b) A qualified rigger (a rigger who is also a qualified person) must inspect the rigging prior to each shift in accordance with WAC 296-155-330.

(c) The headache ball, hook or load must not be used to transport personnel, except as provided in (d) of this subsection.

(d) Cranes or derricks may be used to hoist employees on a personnel platform when work under this part is being conducted if all the provisions of WAC 296-155-525 through 296-155-528 are met.

(e) Safety latches on hooks must not be deactivated or made inoperable except:

(i) When a qualified rigger has determined that the hoisting and placing of purlins and single joists can be performed more safely by doing so; or

(ii) When equivalent protection is provided in a site-specific erection plan.

(4) **Working under loads.**

(a) Routes for suspended loads must be preplanned to ensure that no employee works directly below a suspended load except when:

(i) Engaged in the initial connection of the steel; or

(ii) Necessary for the hooking or unhooking of the load.

(b) When working under suspended loads, the following criteria must be met:

(i) Materials being hoisted must be rigged to prevent unintentional displacement;

(ii) Hooks with self-closing safety latches or their equivalent must be used to prevent components from slipping out of the hook; and

(iii) All loads must be rigged by a qualified rigger.

**(5) Multiple lift rigging procedure.**

(a) A multiple lift must only be performed if the following criteria are met:

- A multiple lift rigging assembly is used;
- A multiple lift is only permitted when specifically within the manufacturer's specifications and limitations;
- A maximum of five members are hoisted per lift;

**Exception:** Bundles of decking must not be lifted using the multiple lift rigging procedure, even though they meet the definition of structural members in WAC 296-155-702.

• Only beams and similar structural members are lifted; and

• All employees engaged in the multiple lift have been trained in these procedures in accordance with WAC 296-155-717 (3)(a).

(b) Components of the multiple lift rigging assembly must be specifically designed and assembled with a maximum capacity for total assembly and for each individual attachment point. This capacity, certified by the manufacturer or a qualified rigger, must be based on the manufacturer's specifications with a five to one safety factor for all components.

(c) The total load must not exceed:

- The rated capacity of the hoisting equipment specified in the hoisting equipment load charts; and
- The rigging capacity specified in the rigging-rating chart.

(d) The multiple lift rigging assembly must be rigged with members:

- Attached at their center of gravity and maintained reasonably level;
- Rigged from top down; and
- Rigged at least seven feet (2.1 m) apart.

(e) The members on the multiple lift rigging assembly must be set from the bottom up.

(f) Controlled load lowering must be used whenever the load is over the connectors.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-05-027, § 296-155-704, filed 2/7/06, effective 4/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 02-13-115, § 296-155-704, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-706 Structural steel assembly. (1)**

Structural stability must be maintained at all times during the erection process.

• Make sure that multistory structures have the following:

- Permanent floors installed as the erection of structural members progress;
- No more than eight stories between the erection floor and the upper-most permanent floor; and
- No more than four floors or forty-eight feet (14.6 m), whichever is less, of unfinished bolting or welding above the foundation or uppermost permanent secured floor.

**Exception:** The above applies except where the structural integrity is maintained as a result of design.

**(2) Walking/working surfaces.**

(a) Shear connectors and other similar devices.

(i) Shear connectors, reinforcing bars, deformed anchors or threaded studs must not be attached to the top flanges of beams, joists or beam attachments so they project vertically

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from or horizontally across the top flange of the member until after the metal decking, or other walking/working surface has been installed. This becomes a tripping hazard. Examples of shear connectors are headed steel studs, steel bars or steel lugs.

(ii) Installation of shear connectors on composite floors. When shear connectors are used in construction of composite floors, roofs and bridge decks, employees must lay out and install the shear connectors after the metal decking has been installed, using the metal decking as a working platform.

(b) Slip resistance of metal decking. (Reserved.)

(c) Workers must not be permitted to walk the top surface of any structural steel member installed after July 18, 2006, that has been coated with paint or similar material. Except when documentation or certification is provided that the coating has achieved a minimum average slip resistance of .50 when measured with an English XL tribometer or equivalent tester on a wetted surface at a testing laboratory is provided. Such documentation or certification must be based on the appropriate ASTM standard test method conducted by a laboratory capable of performing the test. The results must be available at the site and to the steel erector. (Appendix B to this part references appropriate ASTM standard test methods that may be used to comply with this requirement.)

(d) Safe access must be provided to the working level. Employees must not slide down ropes, columns, or ladders.

**(3) Plumbing-up.**

(a) When deemed necessary by a competent person, plumbing-up equipment must be installed in conjunction with the steel erection process to ensure the stability of the structure.

(b) When used, plumbing-up equipment must be in place and properly installed before the structure is loaded with construction material such as loads of joists, bundles of decking or bundles of bridging.

(c) Plumbing-up equipment must be removed only with the approval of a competent person.

**(4) Metal decking.**

(a) Hoisting, landing and placing of metal decking bundles.

(i) Bundle packaging and strapping must not be used for hoisting unless specifically designed for that purpose.

(ii) If loose items such as dunnage, flashing, or other materials are placed on the top of metal decking bundles to be hoisted, such items must be secured to the bundles.

(iii) Bundles of metal decking on joists must be landed in accordance with WAC 296-155-709 (5)(d).

(iv) Metal decking bundles must be landed on framing members so that enough support is provided to allow the bundles to be unbanded without dislodging the bundles from the supports.

(v) At the end of the shift or when environmental or job site conditions require, metal decking must be secured against displacement.

(b) Roof and floor holes and openings. Metal decking at roof and floor holes and openings must be installed as follows:

(i) Framed metal deck openings must have structural members turned down to allow continuous deck installation except where not allowed by structural design constraints or constructibility.

(ii) Roof and floor holes and openings must be decked over. Where large size, configuration or other structural design does not allow openings to be decked over (such as elevator shafts, stair wells, etc.) employees must be protected in accordance with chapter 296-155 WAC, Part C-1 or Part K.

(iii) Metal decking holes and openings must not be cut until immediately prior to being permanently filled with the equipment or structure needed or intended to fulfill its specific use and which meets the strength requirements of (c) of this subsection, or must be immediately covered.

(c) **Covering roof and floor openings.** Smoke dome or skylight fixtures that have been installed are not considered covers for the purpose of this section unless they meet the strength requirements of WAC 296-155-505 (4)(g) (Part K).

(d) **Decking gaps around columns.** Wire mesh, exterior plywood, or equivalent, must be installed around columns where planks or metal decking do not fit tightly. The materials used must be of sufficient strength to provide fall protection for personnel and prevent objects from falling through.

(e) **Installation of metal decking.**

(i) Metal decking must be laid tightly and immediately secured upon placement to prevent accidental movement or displacement.

(ii) During initial placement, metal decking panels must be placed to ensure full support by structural members.

(f) **Derrick floors.**

(i) A derrick floor must be fully decked and or planked and the steel member connections completed to support the intended floor loading.

(ii) Temporary loads placed on a derrick floor must be distributed over the underlying support members so as to prevent local overloading of the deck material.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-706, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-707 Column anchorage. (1) General requirements for erection stability.**

(a) All columns must be anchored by a minimum of four anchor rods (anchor bolts).

(b) Each column anchor rod (anchor bolt) assembly, including the column-to-base plate weld and the column foundation, must be designed to resist a minimum eccentric gravity load of three hundred pounds (136.2 kg) located eighteen inches (.46 m) from the extreme outer face of the column in each direction at the top of the column shaft.

(c) Columns must be set on level finished floors, pre-grouted leveling plates, leveling nuts, or shim packs which are adequate to transfer the construction loads.

(d) All columns must be evaluated by a competent person to determine whether guying or bracing is needed; if guying or bracing is needed, it must be installed.

**(2) Repair, replacement or field modification of anchor rods (anchor bolts).**

(a) Anchor rods (anchor bolts) must not be repaired, replaced or field-modified without the approval of the project structural engineer of record.

(b) Prior to the erection of a column, the controlling contractor must provide written notification to the steel erector if

there has been any repair, replacement or modification of the anchor rods (anchor bolts) of that column.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-707, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-708 Beams and columns. (1) General.**

(a) During the final placing of solid web structural members, the load must not be released from the hoisting line until the members are secured with at least two bolts per connection. These bolts must be of the same size and strength as shown in the erection drawings, drawn up wrench-tight or the equivalent as specified by the project structural engineer of record.

Exception: See subsection (2) of this section.

(b) A competent person must determine if more than two bolts are necessary to ensure the stability of cantilevered members; if additional bolts are needed, they must be installed.

(2) **Diagonal bracing.** Solid web structural members used as diagonal bracing must be secured by at least one bolt per connection drawn up wrench-tight or the equivalent as specified by the project structural engineer of record.

(3)(a) **Double connections at columns and/or at beam webs over a column.** When two structural members on opposite sides of a column web, or a beam web over a column, are connected sharing common connection holes, at least one bolt with its wrench-tight nut must remain connected to the first member unless a shop-attached or field-attached seat or equivalent connection device is supplied with the member to secure the first member and prevent the column from being displaced (see Appendix E to this part for examples of equivalent connection devices).

(b) If a seat or equivalent device is used, the seat (or device) must be designed to support the load during the double connection process. It must be adequately bolted or welded to both a supporting member and the first member before the nuts on the shared bolts are removed to make the double connection.

(4) **Column splices.** Each column splice must be designed to resist a minimum eccentric gravity load of three hundred pounds (136.2 kg) located eighteen inches (.46 m) from the extreme outer face of the column in each direction at the top of the column shaft.

(5) **Perimeter columns.** Perimeter columns must not be erected unless:

(a) The perimeter columns extend a minimum of forty-eight inches (1.2 m) above the finished floor to permit installation of perimeter safety cables prior to erection of the next tier, except where constructibility does not allow (see Appendix D to this part);

(b) The perimeter columns have holes or other devices in or attached to perimeter columns at forty-two to forty-five inches (107-114 cm) above the finished floor and the mid-point between the finished floor and the top cable to permit installation of perimeter safety cables required by WAC 296-155-716 (1)(b), except where constructibility does not allow. (See Appendix D to this part.)

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-708, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-709 Open web steel joists. (1) General.**

(a) Where steel joists are used and columns are not framed in at least two directions with solid web structural steel members, a steel joist must be field-bolted at the column to provide lateral stability to the column during erection.

Exception: See (b) of this subsection. For the installation of this joist:

- (i) A vertical stabilizer plate must be provided on each column for steel joists. The plate must be a minimum of six inch by six inch (152 mm by 152 mm) and must extend at least three inches (76 mm) below the bottom chord of the joist with a 13/16-inch (21 mm) hole to provide an attachment point for guying or plumbing cables.
- (ii) The bottom chords of steel joists at columns must be stabilized to prevent rotation during erection.
- (iii) Hoisting cables must not be released until the seat at each end of the steel joist is field-bolted, and each end of the bottom chord is restrained by the column stabilizer plate.

(b) Where constructibility does not allow a steel joist to be installed at the column:

(i) An alternate means of stabilizing joists must be installed on both sides near the column and must:

- Provide stability equivalent to (a) of this subsection;
- Be designed by a qualified person;
- Be shop installed; and
- Be included in the erection drawings.

(ii) Hoisting cables must not be released until the seat at each end of the steel joist is field-bolted and the joist is stabilized.

(c) Where steel joists at or near columns span sixty feet (18.3 m) or less, the joist must be designed with sufficient strength to allow one employee to release the hoisting cable without the need for erection bridging.

(d) Where steel joists at or near columns span more than sixty feet (18.3 m), the joists must be set in tandem with all bridging installed unless an alternative method of erection, which provides equivalent stability to the steel joist, is designed by a qualified person and is included in the site-specific erection plan.

(e) A steel joist or steel joist girder must not be placed on any support structure unless such structure is stabilized.

(f) When steel joist(s) are landed on a structure, they must be secured to prevent unintentional displacement prior to installation.

(g) No modification that affects the strength of a steel joist or steel joist girder must be made without the approval of the project structural engineer of record.

(h) Field-bolted joists.

(i) Except for steel joists that have been preassembled into panels, connections of individual steel joists to steel structures in bays of forty feet (12.2 m) or more must be fabricated to allow for field bolting during erection.

(ii) These connections must be field-bolted unless constructibility does not allow.

(i) Steel joists and steel joist girders must not be used as anchorage points for a fall arrest system unless written approval to do so is obtained from a qualified person.

(j) A bridging terminus point must be established before bridging is installed. (See Appendix E to this part.)

**(2) Attachment of steel joists and steel joist girders.**

(a) Each end of "K" series steel joists must be attached to the support structure with a minimum of two 1/8-inch (3 mm)

fillet welds one inch (25 mm) long or with two 1/2-inch (13 mm) bolts, or the equivalent.

(b) Each end of "LH" and "DLH" series steel joists and steel joist girders must be attached to the support structure with a minimum of two 1/4-inch (6 mm) fillet welds two inches (51 mm) long, or with two 3/4-inch (19 mm) bolts, or the equivalent.

(c) Except as provided in (d) of this subsection, each steel joist must be attached to the support structure, at least at one end on both sides of the seat, immediately upon placement in the final erection position and before additional joists are placed.

(d) Panels that have been preassembled from steel joists with bridging must be attached to the structure at each corner before the hoisting cables are released.

**(3) Erection of steel joists.**

(a) Both sides of the seat of one end of each steel joist that requires bridging under Tables A and B must be attached to the support structure before hoisting cables are released.

(b) For joists over sixty feet, both ends of the joist must be attached as specified in subsections (2) and (4) of this section before the hoisting cables are released.

(c) On steel joists that do not require erection bridging under Tables A and B, only one employee must be allowed on the joist until all bridging is installed and anchored.

**Table A—Erection of Bridging for Short Span Joists**

Joist	Span	Joist	Span	Joist	Span
8L1	NM	22K10	40-0	14KCS1	NM
10K1	NM	22K11	40-0	14KCS2	NM
12K1	23-0	24K4	36-0	14KCS3	NM
12K3	NM	24K5	38-0	16KCS2	NM
12K5	NM	24K6	39-0	16KCS3	NM
14K1	27-0	24K7	43-0	16KCS4	NM
14K3	NM	24K8	43-0	16KCS5	NM
14K4	NM	24K9	44-0	18KCS2	35-0
14K6	NM	24K10	NM	18KCS3	NM
16K2	29-0	24K12	NM	18KCS4	NM
16K3	30-0	26K5	38-0	18KCS5	NM
16K4	32-0	26K6	39-0	20KCS2	36-0
16K5	32-0	26K7	43-0	20KCS3	39-0
16K6	NM	26K8	44-0	20KCS4	NM
16K7	NM	26K9	45-0	20KCS5	NM
16K9	NM	26K10	49-0	22KCS2	36-0
18K3	31-0	26K12	NM	22KCS3	40-0
18K4	32-0	28K6	40-0	22KCS4	NM
18K5	33-0	28K7	43-0	22KCS5	NM
18K6	35-0	28K8	44-0	24KCS2	39-0
18K7	NM	28K9	45-0	24KCS3	44-0
18K9	NM	28K10	49-0	24KCS4	NM
18K10	NM	28K12	53-0	24KCS5	NM
20K3	32-0	30K7	44-0	26KCS2	39-0
20K4	34-0	30K8	45-0	26KCS3	44-0
20K5	34-0	30K9	45-0	26KCS4	NM
20K6	36-0	30K10	50-0	26KCS5	NM
20K7	39-0	30K11	52-0	28KCS2	40-0
20K9	39-0	30K12	54-0	28KCS3	45-0
20K10	NM	10KCS1	NM	28KCS4	53-0
22K4	34-0	10KCS2	NM	28KCS5	53-0
22K5	35-0	10KCS3	NM	30KCS3	45-0
22K6	36-0	12KCS1	NM	30KCS4	54-0
22K7	40-0	12KCS2	NM	30KCS5	54-0
22K9	40-0	12KCS3	NM		

NM = Diagonal bolted bridging not mandatory for joists under 40 feet.

**Table B—Erection Bridging for Long Span Joists**

Joist	Span	Joist	Span
18LH02	33-0	28LH06	42-0
18LH03	NM	28LH07	NM

Joist	Span	Joist	Span
18LH04	NM	28LH08	NM
18LH05	NM	28LH09	NM
18LH06	NM	28LH10	NM
18LH07	NM	28LH11	NM
18LH08	NM	28LH12	NM
18LH09	NM	28LH13	NM
20LH02	33-0	32LH06	47-0 through 60-0
20LH03	38-0	32LH07	47-0 through 60-0
20LH04	NM	32LH08	55-0 through 60-0
20LH05	NM	32LH09	NM through 60-0
20LH06	NM	32LH10	NM through 60-0
20LH07	NM	32LH11	NM through 60-0
20LH08	NM	32LH12	NM through 60-0
20LH09	NM	32LH13	NM through 60-0
20LH10	NM	32LH14	NM through 60-0
24LH03	35-0	32LH15	NM through 60-0
24LH04	39-0	36LH07	47-0 through 60-0
24LH05	40-0	36LH08	47-0 through 60-0
24LH06	45-0	36LH09	57-0 through 60-0
24LH07	NM	36LH10	NM through 60-0
24LH08	NM	36LH11	NM through 60-0
24LH09	NM	36LH12	NM through 60-0
24LH10	NM	36LH13	NM through 60-0
24LH11	NM	36LH14	NM through 60-0
28LH05	42-0	36LH15	NM through 60-0

NM = Diagonal bolted bridging not mandatory for joists under 40 feet.

(d) Employees must not be allowed on steel joists where the span of the steel joist is equal to or greater than the span shown in Tables A and B except in accordance with WAC 296-155-709(4).

(e) When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points are required to provide stability. (See Appendix E of this part.)

**(4) Erection bridging.**

(a) Where the span of the steel joist is equal to or greater than the span shown in Tables A and B, the following must apply:

(i) A row of bolted diagonal erection bridging must be installed near the midspan of the steel joist;

(ii) Hoisting cables must not be released until this bolted diagonal erection bridging is installed and anchored; and

(iii) No more than one employee must be allowed on these spans until all other bridging is installed and anchored.

(b) Where the span of the steel joist is over sixty feet (18.3 m) through one hundred feet (30.5 m), the following must apply:

(i) All rows of bridging must be bolted diagonal bridging;

(ii) Two rows of bolted diagonal erection bridging must be installed near the third points of the steel joist;

(iii) Hoisting cables must not be released until this bolted diagonal erection bridging is installed and anchored; and

(iv) No more than two employees must be allowed on these spans until all other bridging is installed and anchored.

(c) Where the span of the steel joist is over one hundred feet (30.5 m) through one hundred forty-four feet (43.9 m), the following must apply:

(i) All rows of bridging must be bolted diagonal bridging;

(ii) Hoisting cables must not be released until all bridging is installed and anchored; and

(iii) No more than two employees must be allowed on these spans until all bridging is installed and anchored.

(d) For steel members spanning over one hundred forty-four feet (43.9 m), the erection methods used must be in accordance with WAC 296-155-708.

(e) Where any steel joist specified in subsections (3)(b), (4)(a), (b), and (c) of this section is a bottom chord bearing joist, a row of bolted diagonal bridging must be provided near the support(s). This bridging must be installed and anchored before the hoisting cable(s) is released.

(f) When bolted diagonal erection bridging is required by this section, the following must apply:

(i) The bridging must be indicated on the erection drawing;

(ii) The erection drawing must be the exclusive indicator of the proper placement of this bridging;

(iii) Shop-installed bridging clips, or functional equivalents, must be used where the bridging bolts to the steel joists;

(iv) When two pieces of bridging are attached to the steel joist by a common bolt, the nut that secures the first piece of bridging must not be removed from the bolt for the attachment of the second; and

(v) Bridging attachments must not protrude above the top chord of the steel joist.

**(5) Landing and placing loads.**

(a) During the construction period, the employer placing a load on steel joists must ensure that the load is distributed so as not to exceed the carrying capacity of any steel joist.

(b) Except for (d) of this subsection, no construction loads are allowed on the steel joists until all bridging is installed and anchored and all joist-bearing ends are attached.

(c) The weight of a bundle of joist bridging must not exceed a total of one thousand pounds (454 kg). A bundle of joist bridging must be placed on a minimum of three steel joists that are secured at one end. The edge of the bridging bundle must be positioned within one foot (.30 m) of the secured end.

(d) No bundle of decking may be placed on steel joists until all bridging has been installed and anchored and all joist bearing ends attached, unless all of the following conditions are met:

(i) The employer has first determined from a qualified person and documented in a site-specific erection plan that the structure or portion of the structure is capable of supporting the load;

(ii) The bundle of decking is placed on a minimum of three steel joists;

(iii) The joists supporting the bundle of decking are attached at both ends;

(iv) At least one row of bridging is installed and anchored;

(v) The total weight of the bundle of decking does not exceed four thousand pounds (1816 kg); and

(vi) Placement of the bundle of decking must be in accordance with (e) of this subsection.

(e) The edge of the construction load must be placed within one foot (.30 m) of the bearing surface of the joist end.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-709, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-711 Systems-engineered metal buildings.** (1) All of the requirements of this part apply to the erection of systems-engineered metal buildings except WAC

296-155-707 (column anchorage) and WAC 296-155-709 (open web steel joists).

(2) Each structural column must be anchored by a minimum of four anchor rods (anchor bolts).

(3) Rigid frames must have fifty percent of their bolts or the number of bolts specified by the manufacturer (whichever is greater) installed and tightened on both sides of the web adjacent to each flange before the hoisting equipment is released.

(4) Construction loads must not be placed on any structural steel framework unless such framework is safely bolted, welded or otherwise adequately secured.

(5) In girt and eave strut-to-frame connections, when girts or eave struts share common connection holes, at least one bolt with its wrench-tight nut must remain connected to the first member unless a manufacturer-supplied, field-attached seat or similar connection device is present to secure the first member so that the girt or eave strut is always secured against displacement.

(6) Both ends of all steel joists or cold-formed joists must be fully bolted and/or welded to the support structure before:

- (a) Releasing the hoisting cables;
- (b) Allowing an employee on the joists; or
- (c) Allowing any construction loads on the joists.

(7) Purlins and girts must not be used as an anchorage point for a fall arrest system unless written approval is obtained from a qualified person.

(8) Purlins may only be used as a walking/working surface when installing safety systems, after all permanent bridging has been installed and fall protection is provided.

(9) Construction loads may be placed only within a zone that is within eight feet (2.5 m) of the center line of the primary support member.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-711, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-714 Falling object protection.** (1) Securing loose items aloft. All materials, equipment, and tools, which are not in use while aloft, must be secured against accidental displacement.

(2) Protection from falling objects other than materials being hoisted. The controlling contractor must bar other construction processes below steel erection unless overhead protection for the employees below is provided.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-714, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-716 Fall protection.** (1) **General requirements.**

(a) Fall protection will be in accordance with chapter 296-155 WAC, Parts C-1 and K.

(b) During steel erection activities, fall protection must be as required by chapter 296-155 WAC, Parts C-1 and K. Additionally, on multistory structures, perimeter safety cables must be installed at the final interior and exterior perimeters of the floors as soon as metal decking has been installed. See Appendix D.

(2) **Connectors.** Each connector must: Have completed connector training in accordance with WAC 296-155-717.

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(3) **Custody of fall protection.** Fall protection provided by the steel erector must remain in the area where steel erection activity has been completed, to be used by other trades, only if the controlling contractor or its authorized representative:

(a) Has directed the steel erector to leave the fall protection in place; and

(b) Has inspected and accepted control and responsibility of the fall protection prior to authorizing persons other than steel erectors to work in the area.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-716, filed 6/19/02, effective 9/1/02.]

**WAC 296-155-717 Training.** (1) **Training personnel.** Training required by this section must be provided by a qualified person(s).

(2) **Fall hazard training.** The employer must provide a training program for all employees exposed to fall hazards as required by chapter 296-155 WAC, Part C-1.

(3) **Special training programs.** In addition to the training required in subsection (2) of this section, the employer must provide special training to employees engaged in the following activities:

(a) Multiple lift rigging procedure. The employer must ensure that each employee who performs multiple lift rigging has been provided training in the following areas:

(i) The nature of the hazards associated with multiple lifts; and

(ii) The proper procedures and equipment to perform multiple lifts required by WAC 296-155-704(5).

(b) Connector procedures. The employer must ensure that each connector has been provided training in the following areas:

(i) The nature of the hazards associated with connecting (see Appendix D for nonmandatory training guidelines); and

(ii) The establishment, access, proper connecting techniques, double connections, and work practices, required by WAC 296-155-708(3) and Part C-1, chapter 296-155 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-13-115, § 296-155-717, filed 6/19/02, effective 9/1/02.]

## PART Q UNDERGROUND CONSTRUCTION

**WAC 296-155-725 Definitions applicable to this part.**

(1) "Acceptable" means any device, equipment, or appliance that is either approved by MSHA and maintained in permissible condition, or is listed or labeled for the class and location under Part I of this chapter.

(2) "Bulkhead" means an airtight structure separating the working chamber from free air or from another chamber under a lesser pressure than the working pressure.

(3) "Caisson" means a wood, steel, concrete or reinforced concrete, air- and water-tight chamber in which it is possible for persons to work under air pressure greater than atmospheric pressure to excavate material below water level.

(4) "Cofferdam" means a watertight barricade or enclosure erected, sunk, driven or otherwise fabricated to permit the performance of work where hydrostatic pressure exists.

(5) "Decanting" means a method used for decompressing under emergency circumstances. In this procedure, the

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employees are brought to atmospheric pressure with a very high gas tension in the tissues and then immediately recompressed in a second and separate chamber or lock.

(6) "Emergency locks" means a lock designed to hold and permit the quick passage of an entire shift of employees.

(7) "High air" means air pressure used to supply power to pneumatic tools and devices.

(8) "Low air" means air supplied to pressurize working chambers and locks.

(9) "Man lock" means a chamber through which persons pass from one air pressure environment into another.

(10) "Materials lock" means a chamber through which materials and equipment pass from one air pressure environment into another.

(11) "Medical lock" means a special chamber in which employees are treated for decompression illness. It may also be used in pre-employment physical examinations to determine the adaptability of the prospective employee to changes in pressure.

(12) "Rapid excavation machine" means tunnel boring machines, shields, roadheaders, or any other similar excavation machine.

(13) "Normal condition" means one during which exposure to compressed air is limited to a single continuous working period followed by a single decompression in any given 24-hour period; the total time of exposure to compressed air during the single continuous working period is not interrupted by exposure to normal atmospheric pressure, and a second exposure to compressed air does not occur until at least 12 consecutive hours of exposure to normal atmospheric pressure has elapsed since the employee has been under pressure.

(14) "Pressure" means a force acting on a unit area. Usually shown as pounds per square inch. (p.s.i.)

(15) "Absolute pressure" (p.s.i.a.) means the sum of the atmospheric pressure and gauge pressure (p.s.i.g.)

(16) "Atmospheric pressure" means the pressure of air at sea level, usually 14.7 p.s.i.a. (1 atmosphere), or 0 p.s.i.g.

(17) "Gauge pressure" (p.s.i.g.) means pressure measured by a gauge and indicating the pressure exceeding atmospheric.

(18) "Safety screen" means an air- and water-tight diaphragm placed across the upper part of a compressed air tunnel between the face and bulkhead, in order to prevent flooding the crown of the tunnel between the safety screen and the bulkhead, thus providing a safe means of refuge and exit from a flooding or flooded tunnel.

(19) "Special decompression chamber" means a chamber to provide greater comfort for employees when the total decompression time exceeds 75 minutes.

(20) "Working chamber" means the space or compartment under air pressure in which the work is being done.

(21) "C.F.R." means Code of Federal Regulations.

(22) "MSHA" means Mine Safety and Health Administration.

(23) "NIOSH" means National Institute for Occupational Safety and Health.

[Statutory Authority: Chapter 49.17 RCW, 90-03-029 (Order 89-20), § 296-155-725, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-725, filed 1/21/86; Order 74-26, § 296-155-725, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-730 Tunnels and shafts.** (1) Scope and application.

(a) This section applies to the construction of underground tunnels, shafts, chambers, and passageways. This section also applies to cut-and-cover excavations which are both physically connected to ongoing underground construction operations within the scope of this section, and covered in such a manner as to create conditions characteristic of underground construction.

(b) This section does not apply to excavation and trenching operations covered by Part N of this chapter, such as foundation operations for above-ground structures that are not physically connected to underground construction operations, and surface excavation.

(c) The employer shall comply with the requirements of this part and chapter in addition to applicable requirements of chapter 296-36 WAC, Safety standards—Compressed air work.

(2) Access and egress.

(a) Each operation shall have a check-in/check-out system that will provide positive identification of every employee underground. An accurate record of identification and location of the employees shall be kept on the surface. This procedure is not required when the construction of underground facilities designed for human occupancy has been sufficiently completed so that the permanent environmental controls are effective, and when the remaining construction activity will not cause any environmental hazard, or structural failure within the facilities.

(b) The employer shall provide and maintain safe means of access and egress to all work stations.

(c) The employer shall provide access and egress in such a manner that employees are protected from being struck by excavators, haulage machines, trains, and other mobile equipment.

(d) The employer shall control access to all openings to prevent unauthorized entry underground. Unused chutes, manways, or other openings shall be tightly covered, bulkheaded, or fenced off, and shall be posted with warning signs indicating "keep out" or similar language. Completed or unused sections of the underground facility shall be barricaded.

(3) Safety instruction. All employees shall be instructed in the recognition and avoidance of hazards associated with underground construction activities including, where appropriate, the following subjects:

(a) Air monitoring;

(b) Ventilation;

(c) Confined space entry procedures;

(d) Permit-required confined space entry procedures;

(e) Illumination;

(f) Communications;

(g) Flood control;

(h) Mechanical equipment;

(i) Personal protective equipment;

(j) Explosives;

(k) Fire prevention and protection; and

(l) Emergency procedures, including evacuation plans and check-in/check-out systems.

## (4) Notification.

(a) Oncoming shifts shall be informed of any hazardous occurrences or conditions that have affected, or might affect employee safety, including liberation of gas, equipment failures, earth or rock slides, cave-ins, floodings, fire(s), or explosions.

(b) Information specified in (a) of this subsection shall be recorded in a shift journal which shall be current prior to the end of each shift, and shall be located aboveground.

(c) Oncoming supervisory personnel shall read the notification prior to going underground, and shall signify their understanding of the contents by affixing their respective initials to the log.

(d) The hazard notification log shall be retained on the site until the completion of the project.

(e) The employer shall establish and maintain direct communications for coordination of activities with other employers whose operations at the job site affect or may affect the safety of employees underground.

## (5) Communications.

(a) When natural unassisted voice communication is ineffective, a power-assisted means of voice communication shall be used to provide communication between the work face, the bottom of the shaft, and the surface.

(b) Two effective means of communication, at least one of which shall be voice communication, shall be provided in all shafts which are being developed or used either for personnel access or for hoisting. Additional requirements for hoist operator communication are contained in subsection (22)(c)(xv) of this section.

(c) Powered communication systems shall operate on an independent power supply, and shall be installed so that the use of or disruption of any one phone or signal location will not disrupt the operation of the system from any other location.

(d) Communication systems shall be tested upon initial entry of each shift to the underground, and as often as necessary at later times, to ensure that they are in working order.

(e) Any employee working alone underground in a hazardous location, who is both out of the range of natural unassisted voice communication and not under observation by other persons, shall be provided with an effective means of obtaining assistance in an emergency.

(6) Emergency provisions. Hoisting capability. When a shaft is used as a means of egress, the employer shall make advance arrangements for power-assisted hoisting capability to be readily available in an emergency, unless the regular hoisting means can continue to function in the event of an electrical power failure at the job site. Such hoisting means shall be designed so that the load hoist drum is powered in both directions of rotation and so that the brake is automatically applied upon power release or failure.

(7) Self-rescuers. The employer must provide self-rescuers certified by the National Institute for Occupational Safety and Health under 42 CFR part 84. The respirators must be immediately available to all employees at work stations in underground areas where employees might be trapped by smoke or gas. The selection, issuance, use, and care of respirators must be in accordance with the requirements of chapter 296-842 WAC.

(8) Designated person. At least one designated person shall be on duty aboveground whenever any employee is working underground. This designated person shall be responsible for securing immediate aid and keeping an accurate record of the number, identification, and location of employees who are underground in case of emergency. The designated person must not be so busy with other responsibilities that the personnel counting and identification function is encumbered.

(9) Emergency lighting. Each employee underground shall have an acceptable portable hand lamp or cap lamp in his or her work area for emergency use, unless natural light or an emergency lighting system provides adequate illumination for escape.

## (10) Rescue teams.

(a) On job sites where 25 or more employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available rescue services to provide) at least two 5-person rescue teams, one on the job site or within one-half hour travel time from the entry point, and the other within 2 hours travel time.

(b) On job sites where less than 25 employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available rescue services to provide) at least one 5-person rescue team to be either on the job site or within one-half hour travel time from the entry point.

(c) Rescue team members shall be qualified in rescue procedures, the use and limitations of breathing apparatus, and the use of fire fighting equipment. Qualifications shall be reviewed not less than annually.

(d) On job sites where flammable or noxious gases are encountered or anticipated in hazardous quantities, rescue team members shall practice donning and using pressure demand mode, self-contained breathing apparatuses monthly.

(e) The employer shall ensure that rescue teams are familiar with conditions at the job site.

## (11) Hazardous classifications.

(a) Potentially gassy operations. Underground construction operations shall be classified as potentially gassy if either:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) +/- 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for more than a 24-hour period; or

(ii) The history of the geographical area or geological formation indicates that 10 percent or more of the lower explosive limit for methane or other flammable gases is likely to be encountered in such underground operations.

(b) Gassy operations. Underground construction operations shall be classified as gassy if:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) +/- 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for three consecutive days; or

(ii) There has been an ignition of methane or of other flammable gases emanating from the strata that indicates the presence of such gases; or

(iii) The underground construction operation is both connected to an underground work area which is currently classified as gassy and is also subject to a continuous course of air containing the flammable gas concentration.

(c) Declassification to potentially gassy operations. Underground construction gassy operations may be declassified to potentially gassy when air monitoring results remain under 10 percent of the lower explosive limit for methane or other flammable gases for three consecutive days.

(12) Gassy operations—Additional requirements. Only acceptable equipment, maintained in suitable condition, shall be used in gassy operations.

(a) Mobile diesel-powered equipment used in gassy operations shall be either approved in accordance with the requirements of 30 CFR Part 36 (formerly Schedule 31) by MSHA, or shall be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and shall be operated in accordance with that part.

(b) Each entrance to a gassy operation shall be prominently posted with signs notifying all entrants of the gassy classification.

(c) Smoking shall be prohibited in all gassy operations and the employer shall be responsible for collecting all personal sources of ignition, such as matches and lighters, from all persons entering a gassy operation.

(d) A fire watch as described in chapter 296-155 WAC, Part H, shall be maintained when hot work is performed.

(e) Once an operation has met the criteria in subsection (11)(a)(i) of this section, warranting classification as gassy, all operations in the affected area, except the following, shall be discontinued until the operation either is in compliance with all of the gassy operation requirements or has been declassified in accordance with (c) of this subsection:

(i) Operations related to the control of the gas concentration;

(ii) Installation of new equipment, or conversion of existing equipment, to comply with this subsection; and

(iii) Installation of above-ground controls for reversing the air flow.

(13) Air quality and monitoring.

(a) General. Air quality limits and control requirements specified in chapter 296-841 WAC shall apply except as modified by this subsection.

(b) The employer shall assign a competent person who shall perform all air monitoring required by this section.

(c) Where this section requires monitoring of airborne contaminants "as often as necessary," the competent person shall make a reasonable determination as to which substances to monitor and how frequently to monitor, considering at least the following factors:

(i) Location of job site: Proximity to fuel tanks, sewers, gas lines, old landfills, coal deposits, and swamps;

(ii) Geology: Geological studies of the job site, particularly involving the soil type and its permeability;

(iii) History: Presence of air contaminants in nearby job sites, changes in levels of substances monitored on the prior shift; and

(iv) Work practices and job site conditions: The use of diesel engines, use of explosives, use of fuel gas, volume and flow of ventilation, visible atmospheric conditions, decom-

pression of the atmosphere, welding, cutting and hot work, and employees' physical reactions to working underground.

(d) The employer shall provide testing and monitoring instruments which are capable of achieving compliance with the provisions of this subsection, and:

(i) Shall maintain the testing and monitoring instruments in good condition;

(ii) Shall calibrate the instruments on a frequency not to exceed 6 months.

(e) Exposure to airborne contaminants shall not exceed the levels established by chapter 296-841 WAC.

(f) Respirators shall not be substituted for environmental control measures. However, where environmental controls have not yet been developed, or when necessary by the nature of the work involved (for example, welding, sand blasting, lead burning), an employee may work for short periods of time in concentrations of airborne contaminants which exceed the limit of permissible exposure referred to in (d) of this subsection, if the employee wears a respiratory protective device certified by MSHA-NIOSH for protection against the particular hazards involved, and the selection and use of respirators complies with the provisions of chapter 296-842 WAC.

(g) Employees shall be withdrawn from areas in which there is a concentration of an airborne contaminant which exceeds the permissible exposure limit listed for that contaminant, except as modified in (t)(i) and (ii) of this subsection.

(h) The atmosphere in all underground work areas shall be tested as often as necessary to assure that the atmosphere at normal atmospheric pressure contains at least 19.5 percent oxygen and no more than 22 percent oxygen.

(i) Tests for oxygen content shall be made before tests for air contaminants.

(j) Field-type oxygen analyzers, or other suitable devices, shall be used to test for oxygen deficiency.

(k) The atmosphere in all underground work areas shall be tested quantitatively for carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dust, vapors, mists, and fumes as often as necessary to ensure that the permissible exposure limits prescribed in chapter 296-62 WAC, Part H, are not exceeded.

(l) The atmosphere in all underground work areas shall be tested quantitatively for methane and other flammable gases as often as necessary to determine:

(i) Whether action is to be taken under (q), (r), and (s) of this subsection; and

(ii) Whether an operation is to be classified potentially gassy or gassy under subsection (11) of this section.

(m) If diesel-engine or gasoline-engine driven ventilating fans or compressors are used, an initial test shall be made of the inlet air of the fan or compressor, with the engines operating, to ensure that the air supply is not contaminated by engine exhaust.

(n) Testing shall be performed as often as necessary to ensure that the ventilation requirements of subsection (15) of this section are met.

(o) When rapid excavation machines are used, a continuous flammable gas monitor shall be operated at the face with the sensor(s) placed as high and close to the front of the machine's cutter head as practicable.

(p) Whenever air monitoring indicates the presence of 5 ppm or more of hydrogen sulfide, a test shall be conducted in the affected underground work area(s), at least at the beginning and midpoint of each shift, until the concentration of hydrogen sulfide has been less than 5 ppm for 3 consecutive days.

(i) Whenever hydrogen sulfide is detected in an amount exceeding 10 ppm, a continuous sampling and indicating hydrogen sulfide monitor shall be used to monitor the affected work area.

(ii) Employees shall be informed when a concentration of 10 ppm hydrogen sulfide is exceeded.

(iii) The continuous sampling and indicating hydrogen sulfide monitor shall be designed, installed, and maintained to provide a visual and aural alarm when the hydrogen sulfide concentration reaches 15 ppm to signal that additional measures, such as respirator use, increased ventilation, or evacuation, might be necessary to maintain hydrogen sulfide exposure below the permissible exposure limit.

(q) When the competent person determines, on the basis of air monitoring results or other information, that air contaminants may be present in sufficient quantity to be dangerous to life, the employer shall:

(i) Prominently post a notice at all entrances to the underground job site to inform all entrants of the hazardous condition; and

(ii) Immediately increase sampling frequency levels to insure workers are not exposed to identified contaminants in excess of the permissible exposure limit(s); and

(iii) Ensure that all necessary precautions are taken to comply with pertinent requirements of this section, and chapter 296-62 WAC.

(r) Whenever five percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return, steps shall be taken to increase ventilation air volume or otherwise control the gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional ventilation controls may be discontinued when gas concentrations are reduced below five percent of the lower explosive limit, but shall be reinstated whenever the five percent level is exceeded.

(s) Whenever 10 percent or more of the lower explosive limit for methane or other flammable gases is detected in the vicinity of welding, cutting, or other hot work, such work shall be suspended until the concentration of such flammable gas is reduced to less than 10 percent of the lower explosive limit.

(t) Whenever 20 percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return:

(i) All employees, except those necessary to eliminate the hazard, shall be immediately withdrawn to a safe location above ground; and

(ii) Employees who remain underground to correct or eliminate the hazard described in (t) above shall be equipped with approved, pressure demand mode, self-contained breathing apparatus, and shall have received adequate training in the proper use of that equipment.

(iii) Electrical power, except for acceptable pumping and ventilation equipment, shall be cut off to the area endangered

by the flammable gas until the concentration of such gas is reduced to less than 20 percent of the lower explosive limit.

(14) Additional monitoring for potentially gassy and gassy operations. Operations which meet the criteria for potentially gassy and gassy operations set forth in subsection (13) of this section shall be subject to the additional monitoring requirements of this subsection.

(a) A test for oxygen content shall be conducted in the affected underground work areas and work areas immediately adjacent to such areas at least at the beginning and midpoint of each shift.

(b) When using rapid excavation machines, continuous automatic flammable gas monitoring equipment shall be used to monitor the air at the heading, on the rib, and in the return air duct. The continuous monitor shall signal the heading, and shut down electric power in the affected underground work area, except for acceptable pumping and ventilation equipment, when 20 percent or more of the lower explosive limit for methane or other flammable gases is encountered.

(i) A manual flammable gas monitor shall be used as needed, but at least at the beginning and midpoint of each shift, to ensure that the limits prescribed in subsections (11) and (13) of this section are not exceeded. In addition, a manual electrical shut down control shall be provided near the heading.

(ii) Local gas tests shall be made prior to and continuously during any welding, cutting, or other hot work.

(iii) In underground operations driven by drill-and-blast methods, the air in the affected area shall be tested for flammable gas prior to re-entry after blasting, and continuously when employees are working underground.

(c) Recordkeeping. A record of all air quality tests shall be maintained above ground at the worksite and be made available to the director or his/her representatives upon request. The record shall include the location, date, time, substance and amount monitored. Records of exposures to toxic substances shall be retained in accordance with Part B, chapter 296-62 WAC. All other air quality test records shall be retained until completion of the project.

(15) Ventilation.

(a)(i) Fresh air shall be supplied to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.

(ii) Mechanical ventilation shall be provided in all underground work areas except when the employer can demonstrate that natural ventilation provides the necessary air quality through sufficient air volume and air flow.

(b) A minimum of 200 cubic feet (5.7 m<sup>3</sup>) of fresh air per minute shall be supplied for each employee underground.

(c) The linear velocity of air flow in the tunnel bore, in shafts, and in all other underground work areas shall be at least 30 feet (9.15 m) per minute where blasting or rock drilling is conducted, or where other conditions likely to produce dust, fumes, mists, vapors, or gases in harmful or explosive quantities are present.

(d) The direction of mechanical air flow shall be reversible.

(e) Air that has passed through underground oil or fuel-storage areas shall not be used to ventilate working areas.

(f) Following blasting, ventilation systems shall exhaust smoke and fumes to the outside atmosphere before work is resumed in affected areas.

(g) Ventilation doors shall be designed and installed so that they remain closed when in use, regardless of the direction of the air flow.

(h) When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a competent person shall test all affected areas after ventilation has been restored and shall determine whether the atmosphere is within flammable limits before any power, other than for acceptable equipment, is restored or work is resumed.

(i) Whenever the ventilation system has been shut down with all employees out of the underground area, only competent persons authorized to test for air contaminants shall be allowed underground until the ventilation has been restored and all affected areas have been tested for air contaminants and declared safe.

(j) When drilling rock or concrete, appropriate dust control measures shall be taken to maintain dust levels within limits set in chapter 296-155 WAC, Part B-1. Such measures may include, but are not limited to, wet drilling, the use of vacuum collectors, and water mix spray systems.

(k)(i) Internal combustion engines, except diesel-powered engines on mobile equipment, are prohibited underground.

(ii) Mobile diesel-powered equipment used underground in atmospheres other than gassy operations shall be either approved by MSHA in accordance with the provisions of 30 CFR Part 32 (formerly Schedule 24), or shall be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and shall be operated in accordance with that Part. (Each brake horsepower of a diesel engine requires at least 100 cubic feet (28.32 m<sup>3</sup>) of air per minute for suitable operation in addition to the air requirements for personnel. Some engines may require a greater amount of air to ensure that the allowable levels of carbon monoxide, nitric oxide, and nitrogen dioxide are not exceeded.)

(iii) Application shall be made to the mining/explosives section, department of labor and industries, for permission to use specified diesel equipment in a specified underground area and shall include the following:

(A) The type of construction and complete identification data and specifications including analysis of the undiluted exhaust gases of the diesel equipment.

(B) The location where the diesel equipment is to be used.

(C) Before the diesel equipment is taken underground, written permission shall be obtained from the department of labor and industries or its duly authorized representative. A satisfactory test on surface, to show that the exhaust gases do not exceed the maximum percentage of carbon monoxide permitted, shall be required.

(D) Diesel equipment shall only be used underground where the ventilation is controlled by mechanical means and shall not be operated if the ventilating current is less than 100 CFM per horsepower based on the maximum brake horsepower of the engines.

(E) Air measurements shall be made at least once daily in the diesel engine working area and the measurements

entered in the Underground Diesel Engine Record Book. Permissible maximum amounts of noxious gases are as follows:

At engine exhaust ports	Carbon Monoxide	.10%	1,000 ppm <sup>3</sup>
Next to equipment	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Nitrogen Dioxide	.0001%	1 ppm
General atmosphere	Aldehydes	.0002%	2 ppm

<sup>3</sup> Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm Hg. pressure.

(l) Potentially gassy or gassy operations shall have ventilation systems installed which shall:

(i) Be constructed of fire-resistant materials; and

(ii) Have acceptable electrical systems, including fan motors.

(m) Gassy operations shall be provided with controls located aboveground for reversing the air flow of ventilation systems.

(n) In potentially gassy or gassy operations, wherever mine-type ventilation systems using an offset main fan installed on the surface are used, they shall be equipped with explosion-doors or a weak-wall having an area at least equivalent to the cross-sectional area of the airway.

(16) Illumination.

(a) Sufficient lighting shall be provided, in accordance with the requirements of chapter 296-155 WAC, Part B-1, to permit safe operations at the face as well as in the general tunnel or shaft area and at the employees' workplace.

(b) Only acceptable portable lighting shall be used within 50 feet (15.24 m) of any underground heading during explosive handling.

(17) Fire prevention and control. Fire prevention and protection requirements applicable to underground construction operations are found in Part D of this chapter except as modified by the following additional standards.

(a) Open flames and fires are prohibited in all underground construction operations except as permitted for welding, cutting, and other hot work operations.

(i) Smoking may be allowed only in areas free of fire and explosion hazards.

(ii) Readily visible signs prohibiting smoking and open flames shall be posted in areas having fire or explosion hazards.

(iii) The carrying of matches, lighters, or other flame-producing smoking materials shall be prohibited in all underground operations where fire or explosion hazards exist.

(b) The employer may store underground no more than a 24-hour supply of diesel fuel for the underground equipment used at the worksite.

(c) The piping of diesel fuel from the surface to an underground location is permitted only if:

(i) Diesel fuel is contained at the surface in a tank whose maximum capacity is no more than the amount of fuel required to supply for a 24-hour period the equipment serviced by the underground fueling station; and

(ii) The surface tank is connected to the underground fueling station by an acceptable pipe or hose system that is controlled at the surface by a valve, and at the shaft bottom by a hose nozzle; and

(iii) The pipe is empty at all times except when transferring diesel fuel from the surface tank to a piece of equipment in use underground; and

(iv) Hoisting operations in the shaft are suspended during refueling operations if the supply piping in the shaft is not protected from damage.

(d)(i) Gasoline shall not be carried, stored, or used underground.

(ii) Acetylene, liquefied petroleum gas, and methylacetylene propadiene stabilized gas may be used underground only for welding, cutting and other hot work, and only in accordance with Part H of this chapter and subsections (13), (15), (17), and (18) of this section.

(e) Oil, grease, and diesel fuel stored underground shall be kept in tightly sealed containers in fire-resistant areas at least 300 feet (91.44 m) from underground explosive magazines, and at least 100 feet (30.48 m) from shaft stations and steeply inclined passageways. Storage areas shall be positioned or diked so that the contents of ruptured or overturned containers will not flow from the storage area.

(f) Flammable or combustible materials shall not be stored above ground within 100 feet (30.48 m) of any access opening to any underground operation. Where this is not feasible because of space limitations at the job site, such materials may be located within the 100-foot limit, provided that:

(i) They are located as far as practicable from the opening; and

(ii) Either a fire-resistant barrier of not less than one-hour rating is placed between the stored material and the opening, or additional precautions are taken which will protect the materials from ignition sources.

(g) Fire-resistant hydraulic fluids shall be used in hydraulically-actuated underground machinery and equipment unless such equipment is protected by a fire suppression system or by multipurpose fire extinguisher(s) rated at a sufficient capacity for the type and size of hydraulic equipment involved, but rated at least 4A:4OB:C.

(h)(i) Electrical installations in underground areas where oil, grease, or diesel fuel are stored shall be used only for lighting fixtures.

(ii) Lighting fixtures in storage areas, or within 25 feet (7.62 m) of underground areas where oil, grease, or diesel fuel are stored, shall be approved for Class I, Division 2 locations, in accordance with Part I of this chapter.

(i) Leaks and spills of flammable or combustible fluids shall be cleaned up immediately.

(j) A fire extinguisher of at least 4A:4OB:C rating or other equivalent extinguishing means shall be provided at the head pulley and at the tail pulley of underground belt conveyors, and at 300-foot intervals along the belt.

(k) Any structure located underground or within 100 feet (30.48 m) of an opening to the underground shall be constructed of material having a fire-resistance rating of at least one hour.

(18) Welding, cutting, and other hot work. In addition to the requirements of Part H of this chapter, the following requirements shall apply to underground welding, cutting, and other hot work.

(a) No more than the amount of fuel gas and oxygen cylinders necessary to perform welding, cutting, or other hot

work during the next 24-hour period shall be permitted underground.

(b) Noncombustible barriers shall be installed below welding, cutting, or other hot work being done in or over a shaft or raise.

(19) Ground support.

(a) In tunnels (other than hard rock) timber sets, steel rings, steel frames, concrete liners, or other engineered tunnel support systems shall be used. Every tunnel support system shall be designed by a licensed professional engineer. Design specifications shall be available at the worksite.

(b) Portal areas. Portal openings and access areas shall be guarded by shoring, fencing, head walls, shotcreting, or other equivalent protection to ensure safe access of employees and equipment. Adjacent areas shall be scaled or otherwise secured to prevent loose soil, rock, or fractured materials from endangering the portal and access area.

(c) Subsidence areas. The employer shall ensure ground stability in hazardous subsidence areas by shoring, by filling in, or by erecting barricades and posting warning signs to prevent entry.

(d) Underground areas.

(i)(A) A competent person shall inspect the roof, face, and walls of the work area at the start of each shift and as often as necessary to determine ground stability.

(B) Competent persons conducting such inspections shall be protected from loose ground by location, ground support, or equivalent means.

(ii) Ground conditions along haulageways and travelways shall be inspected as frequently as necessary to ensure safe passage.

(iii) Loose ground that might be hazardous to employees shall be taken down, scaled, or supported.

(iv) Torque wrenches shall be used wherever bolts that depend on torsionally applied force are used for ground support.

(v) A competent person shall determine whether rock bolts meet the necessary torque, and shall determine the testing frequency in light of the bolt system, ground conditions, and the distance from vibration sources.

(vi) Suitable protection shall be provided for employees exposed to the hazard of loose ground while installing ground support systems.

(vii) Support sets shall be installed so that the bottoms have sufficient anchorage to prevent ground pressures from dislodging the support base of the sets. Lateral bracing (collar bracing, tie rods, or spreaders) shall be provided between immediately adjacent sets to ensure added stability.

(viii) Damaged or dislodged ground supports that create a hazardous condition shall be promptly repaired or replaced. When replacing supports, the new supports shall be installed before the damaged supports are removed.

(ix) A shield or other type of support shall be used to maintain a safe travelway for employees working in dead-end areas ahead of any support replacement operation.

(e) Shafts.

(i) Shafts and wells over 4 feet (1.219 m) in depth that employees must enter shall be supported by a steel casing, concrete pipe, timber, solid rock, or other suitable material.

(ii)(A) The full depth of the shaft shall be supported by casing or bracing except where the shaft penetrates into solid

rock having characteristics that will not change as a result of exposure. Where the shaft passes through earth into solid rock, or through solid rock into earth, and where there is potential for shear, the casing or bracing shall extend at least 5 feet (1.53 m) into the solid rock. When the shaft terminates in solid rock, the casing or bracing shall extend to the end of the shaft or 5 feet (1.53 m) into the solid rock, whichever is less.

(B) The casing or bracing shall extend 42 inches (1.07 m) plus or minus 3 inches (8 cm) above ground level, except that the minimum casing height may be reduced to 12 inches (0.3 m), provided that a standard railing is installed; that the ground adjacent to the top of the shaft is sloped away from the shaft collar to prevent entry of liquids; and that effective barriers are used to prevent mobile equipment operating near the shaft from jumping over the 12-inch (0.3 m) barrier.

(ii) After blasting operations in shafts, a competent person shall determine if the walls, ladders, timbers, blocking, or wedges have loosened. If so, necessary repairs shall be made before employees other than those assigned to make the repairs are allowed in or below the affected areas.

(f) Blasting. This subsection applies in addition to the requirements for blasting and explosives operations, including handling of misfires, which are found in chapter 296-52 WAC.

(i) Blasting wires shall be kept clear of electrical lines, pipes, rails, and other conductive material, excluding earth, to prevent explosives initiation or employee exposure to electric current.

(ii) Following blasting, an employee shall not enter a work area until the air quality meets the requirements of subsection (13) of this section.

(g) Drilling.

(i) A competent person shall inspect all drilling and associated equipment prior to each use. Equipment defects affecting safety shall be corrected before the equipment is used.

(ii) The drilling area shall be inspected for hazards before the drilling operation is started.

(iii) Employees shall not be allowed on a drill mast while the drill bit is in operation or the drill machine is being moved.

(iv) When a drill machine is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast shall be placed in a safe position.

(v) Receptacles or racks shall be provided for storing drill steel located on jumbos.

(vi) Employees working below jumbo decks shall be warned whenever drilling is about to begin.

(vii) Drills on columns shall be anchored firmly before starting drilling, and shall be retightened as necessary thereafter.

(viii) The employer shall provide mechanical means on the top deck of a jumbo for lifting unwieldy or heavy material.

(ix) When jumbo decks are over 10 feet (3.05 m) in height, the employer shall install stairs wide enough for two persons.

(x) Jumbo decks more than 10 feet (3.05 m) in height shall be equipped with guardrails on all open sides, excluding

access openings of platforms, unless an adjacent surface provides equivalent fall protection.

(xi) Only employees assisting the operator shall be allowed to ride on jumbos, unless the jumbo meets the requirements of subsection (20)(e) of this section.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

(xii) Jumbos shall be chocked to prevent movement while employees are working on them.

(xiii) Walking and working surfaces of jumbos shall be maintained to prevent the hazards of slipping, tripping, and falling.

(xiv) Jumbo decks and stair treads shall be designed to be slip-resistant and secured to prevent accidental displacement.

(xv) Scaling bars shall be available at scaling operations and shall be maintained in good condition at all times. Blunted or severely worn bars shall not be used.

(xvi) Before commencing the drill cycle, the face and lifters shall be examined for misfires (residual explosives) and, if found, they shall be removed before drilling commences at the face. Blasting holes shall not be drilled through blasted rock (muck) or water.

(xvii) Employees in a shaft shall be protected either by location or by suitable barrier(s) if powered mechanical loading equipment is used to remove muck containing unfired explosives.

(xviii) A caution sign reading "buried line," or similar wording shall be posted where air lines are buried or otherwise hidden by water or debris.

(20) Haulage.

(a) A competent person shall inspect haulage equipment before each shift.

(i) Equipment defects affecting safety and health shall be corrected before the equipment is used.

(ii) Powered mobile haulage equipment shall be provided with adequate brakes.

(iii) Power mobile haulage equipment, including trains, shall have audible warning devices to warn employees to stay clear. The operator shall sound the warning device before moving the equipment and whenever necessary during travel.

(iv) The operator shall assure that lights which are visible to employees at both ends of any mobile equipment, including a train, are turned on whenever the equipment is operating.

(v) In those cabs where glazing is used, the glass shall be safety glass, or its equivalent, and shall be maintained and cleaned so that vision is not obstructed.

(b) Antirollback devices or brakes shall be installed on inclined conveyor drive units to prevent conveyors from inadvertently running in reverse. Employees shall not be permitted to ride a power-driven chain, belt, or bucket conveyor unless the conveyor is specifically designed for the transportation of persons.

(c) Endless belt-type manlifts are prohibited in underground construction.

(d) General requirements also applicable to underground construction for use of conveyors in construction are found in chapter 296-155 WAC, Part L.

(e) No employee shall ride haulage equipment unless it is equipped with seating for each passenger and protects pas-

sengers from being struck, crushed, or caught between other equipment or surfaces. Members of train crews may ride on a locomotive if it is equipped with handholds and nonslip steps or footboards. Requirements applicable to underground construction for motor vehicle transportation of employees are found in chapter 296-155 WAC, Part M.

(f) Conveyor lockout.

(i) Conveyors shall be de-energized and locked out with a padlock, and tagged out with a "Do Not Operate" tag at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(ii) Tags or push button stops are not acceptable.

(iii) Persons shall not be allowed to walk on conveyors except for emergency purposes and then only after the conveyor has been deenergized and locked out in accordance with (f) above, and persons can do so safely.

(g) Powered mobile haulage equipment, including trains, shall not be left unattended unless the master switch or motor is turned off; operating controls are in neutral or park position; and the brakes are set, or equivalent precautions are taken to prevent rolling.

(h) Whenever rails serve as a return for a trolley circuit, both rails shall be bonded at every joint and crossbonded every 200 feet (60.96 m).

(i) When dumping cars by hand, the car dumps shall have tiedown chains, bumper blocks, or other locking or holding devices to prevent the cars from overturning.

(j) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices to prevent unintended dumping.

(k) Equipment to be hauled shall be loaded and secured to prevent sliding or dislodgement.

(l)(i) Mobile equipment, including rail-mounted equipment, shall be stopped for manual connecting or service work, and;

(ii) Employees shall not reach between moving cars during coupling operations.

(iii) Couplings shall not be aligned, shifted, or cleaned on moving cars or locomotives.

(iv) Safety chains or other connections shall be used in addition to couplers to connect person cars or powder cars whenever the locomotive is uphill of the cars.

(v) When the grade exceeds one percent and there is a potential for runaway cars, safety chains or other connections shall be used in addition to couplers to connect haulage cars or, as an alternative, the locomotive must be downhill of the train.

(vi) Such safety chains or other connections shall be capable of maintaining connection between cars in the event of either coupler disconnect, failure or breakage.

(m) Parked rail equipment shall be chocked, blocked, or have brakes set to prevent inadvertent movement.

(n) Berms, bumper blocks, safety hooks, or equivalent means shall be provided to prevent overtravel and overturning of haulage equipment at dumping locations.

(o) Bumper blocks or equivalent stopping devices shall be provided at all track dead ends.

(p)(i) Only small handtools, lunch pails, or similar small items may be transported with employees in person cars, or on top of a locomotive.

(ii) When small hand tools or other small items are carried on top of a locomotive, the top shall be designed or modified to retain them while traveling.

(q)(i) Where switching facilities are available, occupied personnel cars shall be pulled, not pushed. If personnel cars must be pushed and visibility of the track ahead is hampered, then a qualified person shall be stationed in the lead car to give signals to the locomotive operator.

(ii) Crew trips shall consist of personnel loads only.

(21) Electrical safety. This subsection applies in addition to the general requirements for electrical safety which are found in Part I of this chapter.

(a) Electric power lines shall be insulated or located away from water lines, telephone lines, air lines, or other conductive materials so that a damaged circuit will not energize the other systems.

(b) Lighting circuits shall be located so that movement of personnel or equipment will not damage the circuits or disrupt service.

(c) Oil-filled transformers shall not be used underground unless they are located in a fire-resistant enclosure suitably vented to the outside and surrounded by a dike to retain the contents of the transformers in the event of rupture.

(22) Hoisting unique to underground construction except as modified by this section, the following provisions of chapter 296-155 WAC, Part L apply: Requirements for cranes are found in WAC 296-155-525. WAC 296-155-528 contains rules applicable to crane hoisting of personnel, except, that the limitations imposed by WAC 296-155-528(2) do not apply to the routine access of employees to the underground via a shaft. Requirements for personnel hoists, material hoists, and elevators are found in WAC 296-155-530 and in this subsection.

(a) General requirements for cranes and hoists.

(i) Materials, tools, and supplies being raised or lowered, whether within a cage or otherwise, shall be secured or stacked in a manner to prevent the load from shifting, snagging, or falling into the shaft.

(ii) A warning light suitably located to warn employees at the shaft bottom and subsurface shaft entrances shall flash whenever a load is above the shaft bottom or subsurface entrances, or the load is being moved in the shaft. This subsection does not apply to fully enclosed hoistways.

(iii) Whenever a hoistway is not fully enclosed and employees are at the shaft bottom, conveyances or equipment shall be stopped at least 15 feet (4.57 m) above the bottom of the shaft and held there until the signalperson at the bottom of the shaft directs the operator to continue lowering the load, except that the load may be lowered without stopping if the load or conveyance is within full view of a bottom signalperson who is in constant voice communication with the operator.

(iv)(A) Before maintenance, repairs, or other work is commenced in the shaft served by a cage, skip, or bucket, the operator and other employees in the area shall be informed and given suitable instructions.

(B) A sign warning that work is being done in the shaft shall be installed at the shaft collar, at the operator's station, and at each underground landing.

(v) Any connection between the hoisting rope and the cage or skip shall be compatible with the type of wire rope used for hoisting.

(vi) Spin-type connections, where used, shall be maintained in a clean condition and protected from foreign matter that could affect their operation.

(vii) Cage, skip, and load connections to the hoist rope shall be made so that the force of the hoist pull, vibration, misalignment, release of lift force, or impact will not disengage the connection. Only closed shackles shall be used for cage and skip rigging.

(viii) When using wire rope wedge sockets, means shall be provided to prevent wedge escapement and to ensure that the wedge is properly seated.

(b) Additional requirements for cranes. Cranes shall be equipped with a limit switch to prevent overtravel at the boom tip. Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(c) Additional requirements for hoists.

(i) Hoists shall be designed so that the load hoist drum is powered in both directions of rotation, and so that brakes are automatically applied upon power release or failure.

(ii) Control levers shall be of the "deadman type" which return automatically to their center (neutral) position upon release.

(iii) When a hoist is used for both personnel hoisting and material hoisting, load and speed ratings for personnel and for materials shall be assigned to the equipment.

(iv) Hoist machines with cast metal parts shall not be used.

(v) Material hoisting may be performed at speeds higher than the rated speed for personnel hoisting if the hoist and components have been designed for such higher speeds and if shaft conditions permit.

(vi) Employees shall not ride on top of any cage, skip, or bucket except when necessary to perform inspection or maintenance of the hoisting system, in which case they shall be protected by a body belt/harness system to prevent falling.

(vii) Personnel and materials (other than small tools and supplies secured in a manner that will not create a hazard to employees) shall not be hoisted together in the same conveyance. However, if the operator is protected from the shifting of materials, then the operator may ride with materials in cages or skips which are designed to be controlled by an operator within the cage or skip.

(viii) Line speed shall not exceed the design limitations of the systems.

(ix) Hoists shall be equipped with landing level indicators at the operator's station. Marking of the hoist rope does not satisfy this requirement.

(x) Whenever glazing is used in the hoist house, it shall be safety glass, or its equivalent, and be free of distortions and obstructions.

(xi) A fire extinguisher that is rated at least 2A:10B:C (multipurpose, dry chemical) shall be mounted in each hoist house.

(xii) Hoist controls shall be arranged so that the operator can perform all operating cycle functions and reach the emergency power cutoff without having to reach beyond the operator's normal operating position.

(xiii) Hoists shall be equipped with limit switches to prevent overtravel at the top and bottom of the hoistway.

(xiv) Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(xv) Hoist operators shall be provided with a closed-circuit voice communication system to each landing station, with speaker-microphones so located that the operator can communicate with individual landing stations during hoist use.

(xvi) When sinking shafts 75 feet (22.86 m) or less in depth, cages, skips, and buckets that may swing, bump, or snag against shaft sides or other structural protrusions shall be guided by fenders, rails, ropes, or a combination of those means.

(xvii) When sinking shafts more than 75 feet (22.86 m) in depth, all cages, skips, and buckets shall be rope or rail-guided to within a rail length from the sinking operation.

(xviii) Cages, skips, and buckets in all completed shafts, or in all shafts being used as completed shafts, shall be rope or rail-guided for the full length of their travel.

(xix) Wire rope used in load lines of material hoists shall be capable of supporting, without failure, at least five times the maximum intended load or the factor recommended by the rope manufacturer, whichever is greater. Refer to chapter 296-155 WAC, Part L, for design factors for wire rope used in personnel hoists. The design factors shall be calculated by dividing the breaking strength of wire rope, as reported in the manufacturer's rating tables, by the total static load, including the weight of the wire rope in the shaft when fully extended.

(xx) A competent person shall visually check all hoisting machinery, equipment, anchorages, and hoisting rope at the beginning of each shift and during hoist use, as necessary.

(xxi) Each safety device shall be checked by a competent person at least weekly during hoist use to ensure suitable operation and safe condition.

(xxii) In order to ensure suitable operation and safe condition of all functions and safety devices, each hoist assembly shall be inspected and load-tested to 100 percent of its rated capacity: At the time of installation; after any repairs or alterations affecting its structural integrity; after the operation of any safety device; and annually when in use. The employer shall prepare a certification record which includes the date each inspection and load-test was performed; the signature of the person who performed the inspection and test; and a serial number or other identifier for the hoist that was inspected and tested. The most recent certification record shall be maintained on file until completion of the project.

(xxiii) Before hoisting personnel or material, the operator shall perform a test run of any cage or skip whenever it has been out of service for one complete shift, and whenever the assembly or components have been repaired or adjusted.

(xiv) Unsafe conditions shall be corrected before using the equipment.

(d) Additional requirements for personnel hoists.

(i) Hoist drum systems shall be equipped with at least two means of stopping the load, each of which shall be capable of stopping and holding 150 percent of the hoist's rated line pull. A broken-rope safety, safety catch, or arrestment device is not a permissible means of stopping under this subsection.

(ii) The operator shall remain within sight and sound of the signals at the operator's station.

(iii) All sides of personnel cages shall be enclosed by one-half inch (12.70 mm) wire mesh (not less than No. 14 gauge or equivalent) to a height of not less than 6 feet (1.83 m). However, when the cage or skip is being used as a work platform, its sides may be reduced in height to 42 inches (1.07 m) when the conveyance is not in motion.

(iv) All personnel cages shall be provided with a positive locking door that does not open outward.

(v) All personnel cages shall be provided with a protective canopy. The canopy shall be made of steel plate, at least 3/16 -inch (4.763 mm) in thickness, or material of equivalent strength and impact resistance. The canopy shall be sloped to the outside, and so designed that a section may be readily pushed upward to afford emergency egress. The canopy shall cover the top in such a manner as to protect those inside from objects falling in the shaft.

(vi) Personnel platforms operating on guide rails or guide ropes shall be equipped with broken-rope safety devices, safety catches, or arrestment devices that will stop and hold 150 percent of the weight of the personnel platform and its maximum rated load.

(vii) During sinking operations in shafts where guides and safeties are not yet used, the travel speed of the personnel platform shall not exceed 200 feet (60.96 m) per minute. Governor controls set for 200 feet (60.96 m) per minute shall be installed in the control system and shall be used during personnel hoisting.

(viii) The personnel platform may travel over the controlled length of the hoistway at rated speeds up to 600 feet (182.88 m) per minute during sinking operations in shafts where guides and safeties are used.

(ix) The personnel platform may travel at rated speeds greater than 600 feet (182.88 m) per minute in complete shafts.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-155-730, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-155-730, filed 8/8/01, effective 9/1/01; 99-10-071, § 296-155-730, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-730, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-730, filed 1/18/95, effective 3/1/95; 94-15-096 (Order 94-07), § 296-155-730, filed 7/20/94, effective 9/20/94; 91-11-070 (Order 91-01), § 296-155-730, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-155-730, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-730, filed 1/21/86; Order 76-29, § 296-155-730, filed 9/30/76; Order 74-26, § 296-155-730, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-735 Caissons.** (1) Wherever, in caisson work in which compressed air is used, and the working chamber is less than 11 feet in length, and when such caissons are at any time suspended or hung while work is in progress so that the bottom of the excavation is more than 9 feet below the deck of the working chamber, a shield shall be erected therein for the protection of the employees.

(2) Shafts shall be subjected to a hydrostatic or airpressure test, at which pressure they shall be tight. The shaft shall be stamped on the outside shell about 12 inches from each flange to show the pressure to which they have been subjected.

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(3) Whenever a shaft is used, it shall be provided, where space permits, with a safe, proper, and suitable staircase for its entire length, including landing platforms, not more than 20 feet apart. Where this is impracticable, suitable ladders shall be installed with landing platforms located about 20 feet apart to break the climb.

(4) All caissons, having a diameter or side greater than 10 feet shall be provided with a man lock and shaft for the exclusive use of employees.

(5) In addition to the gauge in the locks, an accurate gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and kept in accurate working order.

(6) In caisson operations where employees are exposed to compressed air working environments, the requirements contained in WAC 296-155-745 shall be complied with.

[Order 74-26, § 296-155-735, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-740 Cofferdams.** (1) If overtopping of the cofferdam by high waters is possible, means shall be provided for controlled flooding of the work area.

(2) Warning signals for evacuation of employees in case of emergency shall be developed and posted.

(3) Cofferdam walkways, bridges, or ramps with at least two means of rapid exit, shall be provided with guardrails as specified in Part K of this chapter.

(4) Manways and ladderways shall be installed separately from the hoistways and partitioned off to prevent hoisted materials from protruding into or falling into manways and/or ladderways.

(5) Pumping equipment shall be located on substantially constructed platforms and where installed in such a position that persons must work below, toe boards shall be installed on the platform.

(6) Cofferdams located close to navigable shipping channels shall be protected from vessels in transit, where possible.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-740, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-740, filed 4/25/95, effective 10/1/95; Order 74-26, § 296-155-740, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-745 Compressed air.** (1) General provisions.

(a) There shall be present, at all times, at least one competent person designated by and representing the employer, who shall be familiar with this part in all respects and responsible for full compliance with these and other applicable parts.

(b) Every employee shall be instructed in the rules and regulations which concern their safety or the safety of others.

(2) Medical attendance, examination, and regulations.

(a) There shall be retained one or more licensed physicians familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. They shall be available at all times while work is in progress in order to provide medical supervision of employees employed in compressed air work. They shall be physically qualified and be willing to enter a pressurized environment.

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(b) No employee shall be permitted to enter a compressed air environment until they have been examined by the physician and reported to be physically qualified to engage in such work.

(c) In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, they shall not resume work until they are reexamined by the physician, and their physical condition reported, as provided in this subsection, to be such as to permit them to work in compressed air.

(d) After an employee has been employed continuously in compressed air for a period designated by the physician, but not to exceed 1 year, the employee shall be reexamined by the physician to determine if they are still physically qualified to engage in compressed air work.

(e) Such physician shall at all times keep a complete and full record of examinations made by themselves. The physician shall also keep an accurate record of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

(f) Records shall be available for the inspection by the director or his/her representatives, and a copy thereof shall be forwarded to the department within 48 hours following the occurrence of the accident, death, injury, or decompression illness. It shall state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the director.

(g) A fully equipped first-aid station shall be provided at each tunnel project regardless of the number of persons employed. An ambulance or transportation suitable for a litter case shall be at each project.

(h) Where tunnels are being excavated from portals more than 5 road miles apart, a first-aid station and transportation facilities shall be provided at each portal.

(i) A medical lock shall be established and maintained in immediate working order whenever air pressure in the working chamber is increased above the normal atmosphere.

(j) The medical lock shall:

(i) Have at least 6 feet of clear headroom at the center, and be subdivided into not less than two compartments;

(ii) Be readily accessible to employees working under compressed air;

(iii) Be kept ready for immediate use for at least 5 hours subsequent to the emergence of any employee from the working chamber;

(iv) Be properly heated, lighted and ventilated;

(v) Be maintained in a sanitary condition;

(vi) Have a nonshatterable port through which the occupant(s) may be kept under constant observation;

(vii) Be designed for a working pressure of 75 p.s.i.g.;

(viii) Be equipped with internal controls which may be overridden by external controls;

(ix) Be provided with air pressure gauges to show the air pressure within each compartment to observers inside and outside the medical lock;

(x) Be equipped with a manual type sprinkler system that can be activated inside the lock or by the outside lock tender;

(xi) Be provided with oxygen lines and fittings leading into external tanks. The lines shall be fitted with check valves

to prevent reverse flow. The oxygen system inside the chamber shall be of a closed circuit design and be so designed as to automatically shut off the oxygen supply whenever the fire system is activated.

(xii) Be in constant charge of an attendant under the direct control of the retained physician. The attendant shall be trained in the use of the lock and suitably instructed regarding steps to be taken in the treatment of employee exhibiting symptoms compatible with a diagnosis of decompression illness;

(xiii) Be adjacent to an adequate emergency medical facility;

(xiv) The medical facility shall be equipped with demand-type oxygen inhalation equipment approved by the U.S. Bureau of Mines or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH);

(xv) Be capable of being maintained at a temperature, in use, not to exceed 90°F. nor be less than 70°F.; and

(xvi) Be provided with sources of air, free of oil and carbon monoxide, for normal and emergency use, which are capable of raising the air pressure in the lock from 0 to 75 p.s.i.g. in 5 minutes.

(k) Identification badges shall be furnished to all employees, indicating that the wearer is a compressed air worker. A permanent record shall be kept of all identification badges issued. The badge shall give the employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain instructions that in case of emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the medical lock. The badge shall be worn at all times—off the job, as well as on the job.

(3) Telephone and signal communication. Effective and reliable means of communication, such as bells, whistles, or telephones, shall be maintained at all times between all the following locations;

(a) The working chamber face;

(b) The working chamber side of the man lock near the door;

(c) The interior of the man lock;

(d) Lock attendant's station;

(e) The compressor plant;

(f) The first-aid station;

(g) The emergency lock (if one is required); and

(h) The special decompression chamber (if one is required).

(4) Signs and records.

(a) The time of decompression shall be posted in each man lock as follows:

TIME OF DECOMPRESSION FOR THIS LOCK  
. . . . . pounds to . . . . . pounds in . . . . . minutes.  
. . . . . pounds to . . . . . pounds in . . . . . minutes.

(Signed by) .....  
(Superintendent)

This form shall be posted in the man lock at all times.

(b) Any code of signals used shall be conspicuously posted near workplace entrances and such other locations as

may be necessary to bring them to the attention of all employees concerned.

(c) For each 8-hour shift, a record of employees employed under air pressure shall be kept by an employee who shall remain outside the lock near the entrance. This record shall show the period each employee spends in the air chamber and the time taken from decompression. A copy shall be submitted to the appointed physician after each shift.

(5) Compression.

(a) Every employee going under air pressure for the first time shall be instructed on how to avoid excessive discomfort.

(b) During the compression of employees, the pressure shall not be increased to more than 3 p.s.i.g. within the first minute. The pressure shall be held at 3 p.s.i.g. and again at 7 p.s.i.g. sufficiently long to determine if any employees are experiencing discomfort.

(c) After the first minute the pressure shall be raised uniformly and at a rate not to exceed 10 p.s.i. per minute.

(d) If any employee complains of discomfort, the pressure shall be held to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disappear, the lock attendant shall gradually reduce the pressure until the employee signals that the discomfort has ceased. If the employee does not indicate that the discomfort has disappeared, the lock attendant shall reduce the pressure to atmospheric and the employee shall be released from the lock.

(e) No employee shall be subjected to pressure exceeding 50 pounds per square inch except in an emergency.

(6) Decompression.

(a) Decompression to normal condition shall be in accordance with the decompression tables in Appendix A of this part.

(b) In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the appointed physician shall be responsible for the establishment of methods and procedures of decompression applicable to repetitive exposures.

(c) If decanting is necessary, the appointed physician shall establish procedures before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression following the shift and recompression shall not exceed 5 minutes.

(7) Man locks and special decompression chambers.

(a) Man locks.

(i) Except in emergency, no employees employed in compressed air shall be permitted to pass from the working chamber to atmospheric pressure until after decompression, in accordance with the procedures in this part.

(ii) The lock attendant in charge of a man lock shall be under the direct supervision of the appointed physician. The lock attendant shall be stationed at the lock controls on the free air side during the period of compression and decompression and shall remain at the lock control station whenever there are persons in the working chamber or in the man lock.

(iii) Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock shall be equipped with automatic controls which, through taped programs, cams, or similar apparatus, shall automatically regulate decompressions. It shall also be equipped with manual controls to permit the

lock attendant to override the automatic mechanism in the event of an emergency, as provided in item (viii) of this subdivision.

(iv) A manual control, which can be used in the event of an emergency, shall be placed inside the man lock.

(v) A clock, thermometer, and continuous recording pressure gauge with a 4-hour graph shall be installed outside of each man lock and shall be changed prior to each shift's decompression. The chart shall be of sufficient size to register a legible record of variations in pressure within the man lock and shall be visible to the lock attendant. A copy of each graph shall be submitted to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer shall also be installed in each man lock. Additional fittings shall be provided so that the test gauges may be attached whenever necessary.

(vi) Except where air pressure is below 12 p.s.i.g. and there is no danger of rapid flooding, all caissons having a working area greater than 150 square feet, and each bulkhead in tunnels of 14 feet or more in diameter, or equivalent area, shall have at least two locks in perfect working condition, one of which shall be used exclusively as a man lock, the other, as a materials lock.

(vii) Where only a combination man-and-materials lock is required, this single lock shall be of sufficient capacity to hold the employees constituting two successive shifts.

(viii) Emergency locks shall be large enough to hold an entire heading shift and a limit maintained of 12 p.s.i.g. There shall be a chamber available for oxygen decompression therapy to 28 p.s.i.g.

(ix) The man lock shall be large enough so that those using it are not compelled to be in a cramped position and shall not have less than 5 feet clear head room at the center and a minimum of 30 cubic feet of air space per occupant.

(x) Locks on caissons shall be so located that the bottom door shall be not less than 3 feet above the water level surrounding the caisson on the outside. (The water level, where it is affected by tides, is construed to mean high tide.)

(xi) In addition to the pressure gauge in the locks, an accurate pressure gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and shall be kept in accurate working order.

(xii) Man locks shall have an observation port at least 4 inches in diameter located in such a position that all occupants of the man lock may be observed from the working chamber and from the free air side of the lock.

(xiii) Adequate ventilation in the lock shall be provided.

(xiv) Man locks shall be maintained at a minimum temperature of 70°F.

(xv) When locks are not in use and employees are in the working chamber, lock doors shall be kept open to the working chamber, where practicable.

(xvi) Provision shall be made to allow for rescue parties to enter the tunnel if the working force is disabled.

(xvii) A special decompression chamber of sufficient size to accommodate the entire force of employees being decompressed at the end of a shift shall be provided whenever the regularly established working period requires total time of decompression exceeding 75 minutes.

(b) Special decompression chamber.

(i) The headroom in the special decompression chamber shall be not less than a minimum 7 feet and the cubical content shall provide at least 50 cubic feet of airspace for each employee. For each occupant, there shall be provided 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. The rated capacity shall be based on the stated minimum space per employee and shall be posted at the chamber entrance. The posted capacity shall not be exceeded, except in case of emergency.

(ii) Each special decompression chamber shall be equipped with the following:

(A) A clock or clocks suitably placed so that the attendant and the chamber occupants can readily ascertain the time;

(B) Pressure gauges which will indicate to the attendants and to the chamber occupants the pressure in the chamber;

(C) Valves to enable the attendant to control the supply and discharge of compressed air into and from the chamber.

(D) Valves and pipes, in connection with the air supply and exhaust, arranged so that the chamber pressure can be controlled from within and without;

(E) Effective means of oral intercommunication between the attendant, occupants of the chamber, and the air compressor plant; and

(F) An observation port at the entrance to permit observation of the chamber occupants.

(iii) Seating facilities in special decompression chambers shall be so arranged as to permit a normal sitting posture without cramping. Seating space, not less than 18 inches by 24 inches wide, shall be provided per occupant.

(iv) Adequate toilet and washing facilities, in a screened or enclosed recess, shall be provided. Toilet bowls shall have a built-in protector on the rim so that an air space is created when the seat lid is closed.

(v) Fresh and pure drinking water shall be available. This may be accomplished by either piping water into the special decompression chamber and providing drinking fountains, or by providing individual canteens, or by some other sanitary means. Community drinking vessels are prohibited.

(vi) No refuse or discarded material of any kind shall be permitted to accumulate, and the chamber shall be kept clean.

(vii) Unless the special decompression chamber is serving as the man lock to atmospheric pressure, the special decompression chamber shall be situated, where practicable, adjacent to the man lock on the atmospheric pressure side of the bulkhead. A passageway shall be provided, connecting the special chamber with the man lock, to permit employees in the process of decompression to move from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the next stage of decompression. The passageway shall be so arranged as to not interfere with the normal operation of the man lock, nor with the release of the occupants of the special chamber to atmospheric pressure upon the completion of the decompression procedure.

(8) Compressor plant and air supply.

(a) At all times there shall be a thoroughly experienced, competent, and reliable person on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations, one gauge ten-

der may regulate the pressure in not more than two headings: Provided; That the gauges and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson.

(b) The low air compressor plant shall be of sufficient capacity to not only permit the work to be done safely, but shall also provide a margin to meet emergencies and repairs.

(c) Low air compressor units shall have at least two independent and separate sources of power supply and each shall be capable of operating the entire low air plant and its accessory systems.

(d) The capacity, arrangement, and number of compressors shall be sufficient to maintain the necessary pressure without overloading the equipment and to assure maintenance of such pressure in the working chamber during periods of breakdown, repair, or emergency.

(e) Switching from one independent source of power supply to the other shall be done periodically to ensure that workability of the apparatus in an emergency.

(f) Duplicate low-pressure air feedlines and regulating valves shall be provided between the source of air supply and a point beyond the locks with one of the lines extending to within 100 feet of the working face.

(g) All high-pressure and low-pressure air supply lines shall be equipped with check valves.

(h) Low-pressure air shall be regulated automatically. In addition, manually operated valves shall be provided for emergency conditions.

(i) The air intakes for all air compressors shall be located at a place where fumes, exhaust gases, and other air contaminants will be at a minimum.

(j) Gauges indicating the pressure in the working chamber shall be installed in the compressor building, the lock attendant's station, and at the employer's field office.

(9) Ventilation and air quality.

(a) Exhaust valves and exhaust pipes shall be provided and operated so that the working chamber shall be well ventilated, and there shall be no pockets of dead air. Outlets may be required at intermediate points along the main low-pressure air supply line to the heading to eliminate such pockets of dead air. The quantity of ventilation air shall be not less than 30 cubic feet per minute.

(b) The air in the workplace shall be analyzed by the employer not less than once each shift, and records of such tests shall be kept on file at the place where the work is in progress. The test results shall be within the threshold limit values specified in part B of this chapter, for hazardous gases, and within 10 percent of the lower explosive limit of flammable gases. If these limits are not met, immediate action to correct the situation shall be taken by the employer.

(c) The temperature of all working chambers which are subjected to air pressure shall, by means of after-coolers or other suitable devices, be maintained at a temperature not to exceed 85°F.

(d) Forced ventilation shall be provided during decompression. During the entire decompression period, forced ventilation through chemical or mechanical air purifying devices that will ensure a source of fresh air shall be provided.

(e) Whenever heat-producing machines (moles, shields) are used in compressed air tunnel operations, a positive

means of removing the heat build-up at the heading shall be provided.

(10) Electricity.

(a) All lighting in compressed-air chambers shall be by electricity exclusively, and two independent electric-lighting systems with independent sources of supply shall be used. The emergency source shall be arranged to become automatically operative in the event of failure of the regularly used source.

(b) The minimum intensity of light on any walkway, ladder, stairway, or working level shall be not less than 10 foot-candles, and in all workplaces the lighting shall at all times be such as to enable employees to see clearly.

(c) All electrical equipment, and wiring for light and power circuits, shall comply with requirements of Part I, of this standard, for use in damp, hazardous, high temperature, and compressed air environments.

(d) External parts of lighting fixtures and all other electrical equipment, when within 8 feet of the floor, shall be constructed of noncombustible, nonabsorptive, insulating materials, except that metal may be used if it is effectively grounded.

(e) Portable lamps shall be equipped with noncombustible, nonabsorptive, insulating sockets, approved handles, basket guards, and approved cords.

(f) The use of worn or defective portable and pendant conductors is prohibited.

(11) Sanitation.

(a) Sanitary, heated, lighted, and ventilated dressing rooms and drying rooms shall be provided for all employees engaged in compressed air work. Such rooms shall contain suitable benches and lockers. Bathing accommodations (showers at the ratio of one to 10 employees per shift), equipped with running hot and cold water, and suitable and adequate toilet accommodations, shall be provided. One toilet for each 15 employees, or fractional part thereof, shall be provided.

(b) When the toilet bowl is shut by a cover, there should be an air space so that the bowl or bucket does not implode when pressure is increased.

(c) All parts of caissons and other working compartments shall be kept in a sanitary condition.

(12) Fire prevention and protection.

(a) Fire fighting equipment shall be available at all times and shall be maintained in working condition.

(b) While welding or flame-cutting is being done in compressed air, a firewatch with a fire hose or approved extinguisher shall stand by until such operation is completed.

(c) Shafts and caissons containing flammable material of any kind, either above or below ground, shall be provided with a waterline and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within reach of the hose stream.

(d) Fire hose shall be at least 1 1/2 inches in nominal diameter; the water pressure shall at all times be adequate for efficient operation of the type of nozzle used; and the water supply shall be such as to ensure an uninterrupted flow. Fire hose, when not in use, shall be located or guarded to prevent injury thereto.

(e) The power house, compressor house, and all buildings housing ventilating equipment, shall be provided with at

least one hose connection in the waterline, with a fire hose connected thereto. A fire hose shall be maintained within reach of structures of wood over or near shafts.

(f) Tunnels shall be provided with a 2-inch minimum diameter waterline extending into the working chamber and to within 100 feet of the working face. Such line shall have hose outlets with 100 feet of fire hose attached and maintained as follows: One at the working face; one immediately inside of the bulkhead of the working chamber; and one immediately outside such bulkhead. In addition, hose outlets shall be provided at 200-foot intervals throughout the length of the tunnel, and 100 feet of fire hose shall be attached to the outlet nearest to any location where flammable material is being kept or stored or where any flame is being used.

(g) In addition to fire hose protection required by this part, on every floor of every building not under compressed air, but used in connection with the compressed air work, there shall be provided at least one approved fire extinguisher of the proper type for the hazards involved. At least two approved fire extinguishers shall be provided in the working chamber as follows: One at the working face and one immediately inside the bulkhead (pressure side). Extinguishers in the working chamber shall use water as the primary extinguishing agent and shall not use any extinguishing agent which could be harmful to the employees in the working chamber. The fire extinguisher shall be protected from damage.

(h) Highly combustible materials shall not be used or stored in the working chamber. Wood, paper, and similar combustible material shall not be used in the working chamber in quantities which could cause a fire hazard. The compressor building shall be constructed of noncombustible material.

(i) Man locks shall be equipped with a manual type fire extinguisher system that can be activated inside the man lock and also by the outside lock attendant. In addition, a fire hose and portable fire extinguisher shall be provided inside and outside the man lock. The portable fire extinguisher shall be the dry chemical type.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

(j) Equipment, fixtures, and furniture in man locks and special decompression chambers shall be constructed of noncombustible materials. Bedding, etc., shall be chemically treated so as to be fire resistant.

(k) Head frames shall be constructed of structural steel or open frame-work fireproofed timber. Head houses and other temporary surface buildings or structures within 100 feet of the shaft, caisson, or tunnel opening shall be built of fire-resistant materials.

(l) No oil, gasoline, or other combustible materials shall be stored within 100 feet of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fireproof buildings, provided such buildings are not less than 50 feet from any shaft, caisson, or tunnel opening, or any building directly connected thereto.

(m) Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in the preceding subdivision.

(n) All explosives used in connection with compressed air work shall be selected, stored, transported, and used as specified in part T of this chapter.

(13) Bulkheads and safety screens.

(a) Intermediate bulkheads with locks, or intermediate safety screens or both, are required where there is danger of rapid flooding.

(b) In tunnels 16 feet or more in diameter, hanging walkways shall be provided from the face to the man lock as high in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with Part K of this chapter. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

(c) Bulkheads used to contain compressed air shall be tested, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-155-745, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-745, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-745, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-745, filed 7/20/94, effective 9/20/94; 88-23-054 (Order 88-25), § 296-155-745, filed 11/14/88; Order 74-26, § 296-155-745, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-74501 Appendix A—Decompression tables.**

**APPENDIX A—DECOMPRESSION TABLES**

(1) **Explanation.** The decompression tables are computed for working chamber pressures from 0 to 14 pounds, and from 14 to 50 pounds per square inch gauge inclusive by 2-pound increments and for exposure times for each pressure extending from one-half to over 8 hours inclusive. Decompressions will be conducted by two or more stages with a maximum of four stages, the latter for a working chamber pressure of 40 pounds per square inch gauge or over.

Stage 1 consists of a reduction in ambient pressure ranging from 10 to a maximum of 16 pounds per square inch, but in no instance will the pressure be reduced below 4 pounds at the end of stage 1. This reduction in pressure in stage 1 will always take place at a rate not greater than 5 pounds per minute.

Further reduction in pressure will take place during stage 2 and subsequent stages as required at a slower rate, but in no event at a rate greater than 1 pound per minute.

Decompression Table No. 1 indicates in the body of the table the total decompression time in minutes for various combinations of working chamber pressure and exposure time.

Decompression Table No. 2 indicates for the same various combinations of working chamber pressure and exposure time the following:

- (a) The number of stages required;
- (b) The reduction in pressure and the terminal pressure for each required stage;
- (c) The time in minutes through which the reduction in pressure is accomplished for each required stage;

(d) The pressure reduction rate in minutes per pound for each required stage;

Important note: The pressure reduction in each stage is accomplished at a uniform rate. Do not interpolate between values shown on the tables. Use the next higher value of working chamber pressure or exposure time should the actual working chamber pressure or the actual exposure time, respectively, fall between those for which calculated values are shown in the body of the tables.

Examples:

Example No. 1:

4 hours working period at 20 pounds gauge.

Decompression Table No. 1:

20 pounds for 4 hours, total decompression time. 43 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 20 pounds to 4 pounds at the uniform rate of 5 pounds per minute.  
 Elapsed time stage 1: 16/5— 3 minutes.

Stage 2 (final stage): Reduce pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 40 minutes.

Rate—0.10 per pound per minute or 10 minutes per pound.

Stage 2 (final) elapsed time. 40 minutes.

Total time . . . . . 43 minutes.

Example No. 2:

5-hour working period at 24 pounds gage.

Decompression Table No. 1:

24 pounds for 5 hours, total decompression time. 117 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 24 pounds to 8 pounds at the uniform rate of 5 pounds per minute.  
 Elapsed time stage 1: 16/5 3 minutes.

Stage 2: Reduce pressure at a uniform rate from 8 pounds to 4 pounds over a period of 4 minutes. Rate, 1 pound per minute elapsed time, stage 2 . . . . . 4 minutes.

Transfer person to special decompression chamber maintaining the 4-pound pressure during the transfer operation.

Stage 3 (final stage): In the special decompression chamber, reduce the pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 110 minutes. Rate, 0.037 pound per minute or 27.5 minutes per pound. Stage 3 (final) elapsed time . . . . . 110 minutes.

Total time . . . . . 117 minutes.

DECOMPRESSION TABLE NO. 1

TABLE DECOMPRESSION TIME

Work pressure p.s.i.g.	Working period hours											
	1/2	1	1 1/2	2	3	4	5	6	7	8	Over 8	
0-12 ..	3	3	3	3	3	3	3	3	3	3	3	3
14 .....	6	6	6	6	6	6	6	6	16	16	16	33
16 .....	7	7	7	7	7	7	17	33	48	48	62	62
18 .....	7	7	7	8	11	17	48	63	63	73	87	87
20 .....	7	7	8	15	15	43	63	73	83	103	113	113
22 .....	9	9	16	24	38	68	93	103	113	128	133	133
24 .....	11	12	23	27	52	92	117	122	127	137	151	151
26 .....	13	14	29	34	69	104	126	141	142	142	163	163
28 .....	15	23	31	41	98	127	143	153	153	165	183	183
30 .....	17	28	38	62	105	143	165	168	178	188	204	204
32 .....	19	35	43	85	126	163	178	193	203	213	226	226
34 .....	21	39	58	98	151	178	195	218	223	233	248	248
36 .....	24	44	63	113	170	198	223	233	243	253	273	273
38 .....	28	49	73	128	178	203	223	238	253	263	278	278
40 .....	31	49	84	143	183	213	233	248	258	278	288	288
42 .....	37	56	102	144	189	215	245	260	263	268	293	293
44 .....	43	64	118	154	199	234	254	264	269	269	293	293
46 .....	44	74	139	171	214	244	269	274	289	299	318	318
48 .....	51	89	144	189	229	269	299	309	319	319	...	...
50 .....	58	94	164	209	249	279	309	329	...	...	...	...

DECOMPRESSION TABLE NO. 2

(Do not interpolate, use next higher value for conditions not computed.)

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				
			Pressure reduction P.s.i.g.		Time in stage Minutes Min/Pound	Pressure reduction rate	Total time decompress Minutes
			From	To			
14 .....	1/2 .....	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1 .....	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1 1/2 .....	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	2 .....	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	3 .....	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	4 .....	1	14	0	2	0.20	6
		2	4	0	4	1.00	6
	5 .....	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	6 .....	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	7 .....	1	14	4	2	0.20	6
		2	4	0	14	3.50	16
	8 .....	1	14	4	2	0.20	6
		2	4	0	14	3.50	16
	Over 8 ...	1	14	4	2	0.20	6
		2	4	0	30	7.50	32
16 .....	1/2 .....	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	1 .....	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2 .....	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	2 .....	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	3 .....	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	4 .....	1	14	4	3	0.20	7
		2	4	0	4	1.00	7
	5 .....	1	14	4	3	0.20	7
		2	4	0	4	3.50	17
	6 .....	1	14	4	3	0.20	7

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				
			Pressure reduction P.s.i.g.		Time in stage Minutes Min/Pound	Pressure reduction rate	Total time decompress Minutes
			From	To			
		2	4	0	30	7.50	33
	7 .....	1	14	4	3	0.20	48
		2	4	0	45	11.25	48
	8 .....	1	14	4	3	0.20	48
		2	4	0	45	11.25	48
	Over 8 ...	1	14	4	3	0.20	63
		2	4	0	60	15.00	63
18 .....	1/2 .....	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	1 .....	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2 .....	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	2 .....	1	18	4	3	0.20	8
		2	4	0	5	1.25	8
	3 .....	1	18	4	3	0.20	11
		2	4	0	8	2.00	11
	4 .....	1	18	4	3	0.20	17
		2	4	0	14	3.50	17
	5 .....	1	18	4	3	0.20	48
		2	4	0	45	11.25	48
	6 .....	1	18	4	3	0.20	63
		2	4	0	60	15.00	63
	7 .....	1	18	4	3	0.20	63
		2	4	0	60	15.00	63
	8 .....	1	18	4	3	0.20	73
		2	4	0	70	17.50	73
	Over 8 ...	1	18	4	3	0.20	87
		2	4	0	84	21.00	87
20 .....	1/2 .....	1	20	4	3	0.20	7
		2	4	0	4	1.00	7
	1 .....	1	20	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2 .....	1	20	4	3	0.20	8
		2	4	0	5	1.25	8
	2 .....	1	20	4	3	0.20	15
		2	4	0	12	3.00	15
	3 .....	1	20	4	3	0.20	15
		2	4	0	12	3.00	15
	4 .....	1	20	4	3	0.20	43
		2	4	0	40	10.00	43
	5 .....	1	20	4	3	0.20	63
		2	4	0	60	15.00	63
	6 .....	1	20	4	3	0.20	73
		2	4	0	70	17.50	73
	7 .....	1	20	4	3	0.20	83
		2	4	0	80	20.00	83
	8 .....	1	20	4	3	0.20	103
		2	4	0	100	25.00	103
	Over 8 ...	1	20	4	3	0.20	113
		2	4	0	110	27.50	113
22 .....	1/2 .....	1	22	6	3	0.20	9
		2	6	0	6	1.00	9
	1 .....	1	22	6	3	0.20	9
		2	6	0	6	1.00	9
	1 1/2 .....	1	22	6	3	0.20	16
		2	6	0	13	2.20	16
	2 .....	1	22	6	3	0.20	24
		2	6	0	21	3.50	24
	3 .....	1	22	6	3	0.20	38
		2	6	0	35	5.85	38
	4 .....	1	22	6	3	0.20	68
		2	6	0	65	10.83	68
	5 .....	1	22	6	3	0.20	93
		2	6	0	90	15.00	93
	6 .....	1	22	6	3	0.20	103
		2	6	0	100	16.67	103
	7 .....	1	22	6	3	0.20	113
		2	6	0	110	18.35	113
	8 .....	1	22	6	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
	Over 8 ...	2	6	0	125	20.80	128
		1	22	6	3	0.20	
		2	6	0	130	21.70	133
24	1/2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	4	1.00	11
	1	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	5	1.25	12
	1 1/2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	16	4.00	23
	2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	20	5.00	27
	3	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	45	11.25	52
	4	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	85	21.25	92
	5	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	110	27.50	117
	6	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	115	28.80	122
	7	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	120	30.00	127
	8	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	130	32.50	137
	Over 8 ...	1	24	8	3	0.20	
		2	8	4	8	2.00	
		3	4	0	140	35.00	151
26	1/2	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	4	1.00	13
	1	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	5	1.25	14
	1 1/2	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	20	5.00	29
	2	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	25	6.25	34
	3	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	60	15.00	69
	4	1	26	10	3	0.20	
		2	10	4	6	1.0	
		3	4	0	95	23.75	104
	5	1	26	10	3	0.20	
		2	10	4	8	1.33	
		3	4	0	115	28.80	126
	6	1	26	10	3	0.20	
		2	10	4	8	1.33	
		3	4	0	130	32.50	141
	7	1	26	10	3	0.20	
		2	10	4	9	1.50	
		3	4	0	130	32.50	142
	8	1	26	10	3	0.20	
		2	10	4	9	1.50	
		3	4	0	130	32.50	142
	Over 8 ...	1	26	10	3	0.20	
		2	10	4	30	5.00	
		3	4	0	130	32.50	163
28	1/2	1	28	12	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		2	12	4	8	1.00	
		3	4	0	4	1.00	15
	1	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	12	3.00	23
	1 1/2	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	20	5.00	31
	2	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	30	7.50	41
	3	1	28	12	3	0.20	
		2	12	4	10	1.25	
		3	4	0	85	21.20	98
	4	1	28	12	3	0.20	
		2	12	4	14	1.75	
		3	4	0	110	27.50	127
	5	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	120	30.00	143
	6	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	130	32.50	153
	7	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	130	32.50	153
	8	1	28	12	3	0.20	
		2	12	4	32	4.00	
		3	4	0	130	32.50	165
	Over 8 ...	1	28	12	3	0.20	
		2	12	4	50	6.25	
		3	4	0	130	32.50	183
30	1/2	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	4	1.00	17
	1	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	15	3.75	28
	1 1/2	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	25	6.25	38
	2	1	30	14	3	0.20	
		2	14	4	14	1.40	
		3	4	0	45	11.25	62
	3	1	30	14	3	0.20	
		2	14	4	17	1.70	
		3	4	0	85	21.20	105
	4	1	30	14	3	0.20	
		2	14	4	30	3.00	
		3	4	0	110	27.50	143
	5	1	30	14	3	0.20	
		2	14	4	35	3.50	
		3	4	0	130	32.50	165
	6	1	30	14	3	0.20	
		2	14	4	35	3.50	
		3	4	0	130	32.50	168
	7	1	30	14	3	0.20	
		2	14	4	45	4.50	
		3	4	0	130	32.50	178
	8	1	30	14	3	0.20	
		2	14	4	55	5.50	
		3	4	0	130	32.50	188
	Over 8 ...	1	30	14	3	0.20	
		2	14	4	71	7.10	
		3	4	0	130	32.50	204
32	1/2	1	32	16	3	0.20	
		2	16	4	12	1.00	
		3	4	0	4	1.00	19
	1	1	32	16	3	0.20	
		2	16	4	12	1.00	

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Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		3	4	0	20	5.00	35
1 1/2		1	32	16	3	0.20	
		2	16	4	15	1.25	
		3	4	0	25	6.25	43
2		1	32	16	3	0.20	
		2	16	4	22	1.83	
		3	4	0	60	15.00	85
3		1	32	16	3	0.20	
		2	16	4	28	2.33	
		3	4	0	95	23.75	126
4		1	32	16	3	0.20	
		2	16	4	40	3.33	
		3	4	0	120	30.00	163
5		1	32	16	3	0.20	
		2	16	4	45	3.75	
		3	4	0	130	32.50	178
6		1	32	16	3	0.20	
		2	16	4	60	5.00	
		3	4	0	130	32.50	193
7		1	32	16	3	0.20	
		2	16	4	70	5.83	
		3	4	0	130	32.50	203
8		1	32	16	3	0.20	
		2	16	4	80	6.67	
		3	4	0	130	32.50	213
Over 8		1	32	16	3	0.20	
		2	16	4	93	7.75	
		3	4	0	130	32.50	226
34	1/2	1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	4	1.00	21
1		1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	22	5.50	39
1 1/2		1	34	18	3	0.20	
		2	18	4	25	1.80	
		3	4	0	30	7.50	58
2		1	34	18	3	0.20	
		2	18	4	35	2.50	
		3	4	0	60	15.00	98
3		1	34	18	3	0.20	
		2	18	4	43	3.10	
		3	4	0	105	26.25	151
4		1	34	18	3	0.20	
		2	18	4	55	3.93	
		3	4	0	120	30.00	178
5		1	34	18	3	0.20	
		2	18	4	62	4.43	
		3	4	0	130	32.50	195
6		1	34	18	3	0.20	
		2	18	4	85	6.07	
		3	4	0	130	32.50	218
7		1	34	18	3	0.20	
		2	18	4	90	6.43	
		3	4	0	130	32.50	223
8		1	34	18	3	0.20	
		2	18	4	100	7.15	
		3	4	0	130	32.50	233
Over 8		1	34	18	3	0.20	
		2	18	4	115	8.23	
		3	4	0	130	32.50	248
36	1/2	1	36	20	3	0.20	
		2	20	4	16	1.00	
		3	4	0	5	1.25	24
1		1	36	20	3	0.20	
		2	20	4	16	1.00	
		3	4	0	25	6.25	44
1 1/2		1	36	20	3	0.20	
		2	20	4	30	1.88	
		3	4	0	30	7.50	63

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		1	36	20	3	0.20	
		2	20	4	40	2.50	
		3	4	0	70	17.50	113
3		1	36	20	3	0.20	
		2	20	4	52	3.25	
		3	4	0	115	28.75	170
4		1	36	20	3	0.20	
		2	20	4	65	4.06	
		3	4	0	130	32.50	198
5		1	36	20	3	0.20	
		2	20	4	90	5.63	
		3	4	0	130	32.50	223
6		1	36	20	3	0.20	
		2	20	4	100	6.25	
		3	4	0	130	32.50	233
7		1	36	20	3	0.20	
		2	20	4	110	6.88	
		3	4	0	130	32.50	243
8		1	36	20	3	0.20	
		2	20	4	120	7.50	
		3	4	0	130	32.50	253
Over 8		1	36	20	3	0.20	
		2	20	4	140	8.75	
		3	4	0	130	32.50	273
38	1/2	1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	9	1.50	28
1		1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	30	5.00	49
1 1/2		1	38	22	3	0.20	
		2	22	6	20	1.25	
		3	6	0	50	8.34	73
2		1	38	22	3	0.20	
		2	22	6	30	1.88	
		3	6	0	95	15.83	128
3		1	38	22	3	0.20	
		2	22	6	35	2.19	
		3	6	0	140	23.35	178
4		1	38	22	3	0.20	
		2	22	6	50	3.12	
		3	6	0	150	25.00	203
5		1	38	22	3	0.20	
		2	22	6	55	3.44	
		3	6	0	165	27.50	223
6		1	28	22	3	0.20	
		2	22	6	70	4.38	
		3	6	0	165	27.50	238
7		1	38	22	3	0.20	
		2	22	6	85	5.32	
		3	6	0	165	27.50	253
8		1	38	22	3	0.20	
		2	22	6	95	5.93	
		3	6	0	165	27.50	263
Over 8		1	38	22	3	0.20	
		2	22	6	110	6.88	
		3	6	0	165	27.50	278
40	1/2	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	4	1.00	
		4	4	0	8	2.00	31
1		1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	5	1.25	
		4	4	0	25	6.25	49
1 1/2		1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	20	5.00	
		4	4	0	45	11.25	84
2		1	40	24	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time de-compress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		2	24	8	25	1.56	
		3	8	4	20	5.00	
		4	4	0	95	23.75	143
3	.....	1	40	24	3	0.20	
		2	24	8	30	1.88	
		3	8	4	30	7.50	
		4	4	0	120	30.00	183
4	.....	1	40	24	3	0.20	
		2	24	8	45	2.81	
		3	8	4	35	8.75	
		4	4	0	130	32.50	213
5	.....	1	40	24	3	0.20	
		2	24	8	47	2.94	
		3	8	4	53	13.25	
		4	4	0	130	32.50	233
6	.....	1	40	24	3	0.20	
		2	24	8	55	3.44	
		3	8	4	60	15.00	
		4	4	0	130	32.50	248
7	.....	1	40	24	3	0.20	
		2	24	8	65	4.06	
		3	8	4	60	15.00	
		4	4	0	130	32.50	258
8	.....	1	40	24	3	0.20	
		2	24	8	75	4.70	
		3	8	4	60	15.00	
		4	4	0	130	32.50	268
Over 8	...	1	40	24	3	0.20	
		2	24	8	95	5.93	
		3	8	4	60	15.00	
		4	4	0	130	32.50	288
42	..... 1/2	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	6	1.00	
		4	4	0	12	3.00	37
1	.....	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	12	2.00	
		4	4	0	25	6.25	56
1 1/2	.....	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	23	3.83	
		4	4	0	60	15.00	102
2	.....	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	30	5.00	
		4	4	0	95	23.75	144
3	.....	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	50	8.34	
		4	4	0	120	30.00	189
4	.....	1	42	26	3	0.20	
		2	26	10	17	1.06	
		3	10	4	65	10.83	
		4	4	0	130	32.50	215
5	.....	1	42	26	3	0.20	
		2	26	10	27	1.69	
		3	10	4	85	14.18	
		4	4	0	130	32.50	245
6	.....	1	42	26	3	0.20	
		2	26	10	27	1.69	
		3	10	4	100	16.67	
		4	4	0	130	32.50	260
7	.....	1	42	26	3	0.20	
		2	26	10	30	1.88	
		3	10	4	100	16.67	
		4	4	0	130	32.50	263
8	.....	1	42	26	3	0.20	
		2	26	10	35	2.19	
		3	10	4	100	16.67	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time de-compress Minutes	
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate		
			From	To				
		4	4	0	130	32.50	268	
	Over 8	...	1	42	26	3	0.20	
		2	26	10	60	3.75		
		3	10	4	100	16.67		
		4	4	0	130	32.50	293	
44	..... 1/2	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	8	1.00		
		4	4	0	16	4.00	43	
	1	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	20	2.50		
		4	4	0	25	6.25	64	
	1 1/2	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	27	3.38		
		4	4	0	72	18.00	118	
	2	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	40	5.00		
		4	4	0	95	23.75	154	
	3	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	60	7.50		
		4	4	0	120	30.00	199	
	4	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	85	10.62		
		4	4	0	130	32.50	234	
	5	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	105	13.13		
		4	4	0	130	32.50	254	
	6	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	115	14.38		
		4	4	0	130	32.50	264	
	7	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	120	15.00		
		4	4	0	130	32.50	269	
	8	.....	1	44	28	3	0.20	
		2	28	12	16	1.00		
		3	12	4	120	15.00		
		4	4	0	130	32.50	269	
	Over 8	...	1	44	28	3	0.20	
		2	28	12	40	2.50		
		3	12	4	120	15.00		
		4	4	0	130	32.50	293	
46	..... 1/2	.....	1	46	30	3	0.20	
		2	30	14	16	1.00		
		3	14	4	10	1.00		
		4	4	0	15	3.75	44	
	1	.....	1	46	30	3	0.20	
		2	30	14	16	1.00		
		3	14	4	25	2.50		
		4	4	0	30	7.50	74	
	1 1/2	.....	1	46	30	3	0.20	
		2	30	14	16	1.00		
		3	14	4	35	3.50		
		4	4	0	85	21.20	139	
	2	.....	1	46	30	3	0.20	
		2	30	14	16	1.00		
		3	14	4	47	4.70		
		4	4	0	105	26.25	171	
	3	.....	1	46	30	3	0.20	
		2	30	14	16	1.00		
		3	14	4	65	6.50		
		4	4	0	130	32.50	214	
	4	.....	1	46	30	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes	
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate		
			From	To				
		2	30	14	16	1.00		
		3	14	4	95	9.50		
		4	4	0	130	32.50	244	
5	.....	1	46	30	3	0.20		
		2	30	14	16	1.00		
		3	14	4	120	12.00		
		4	4	0	130	32.50	269	
6	.....	1	46	30	3	0.20		
		2	30	14	16	1.00		
		3	14	4	125	12.50		
		4	4	0	130	32.50	274	
7	.....	1	46	30	3	0.20		
		2	30	14	16	1.00		
		3	14	4	140	14.00		
		4	4	0	130	32.50	289	
8	.....	1	46	30	3	0.20		
		2	30	14	16	1.00		
		3	14	4	150	15.00		
		4	4	0	130	32.50	299	
Over 8	...	1	46	30	3	0.20		
		2	30	14	25	1.56		
		3	14	4	160	16.00		
		4	4	0	130	32.50	318	
48	1/2	.....	1	48	32	3	0.20	
			2	32	16	16	1.00	
			3	16	4	12	1.00	
			4	4	0	20	5.00	51
1	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	35	2.92		
		4	4	0	35	8.75	89	
1 1/2	....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	45	3.75		
		4	4	0	80	20.00	144	
2	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	60	5.00		
		4	4	0	110	27.50	189	
3	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	90	7.50		
		4	4	0	120	30.00	229	
4	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	120	10.00		
		4	4	0	130	32.50	269	
5	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	140	11.67		
		4	4	0	130	32.50	299	
6	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	160	13.33		
		4	4	0	130	32.50	309	
7	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	170	14.17		
		4	4	0	130	32.50	319	
8	.....	1	48	32	3	0.20		
		2	32	16	16	1.00		
		3	16	4	170	14.17		
		4	4	0	130	32.50	319	
50	1/2	.....	1	50	34	3	0.20	
		2	34	18	16	1.00		
		3	18	4	14	1.00		
		4	4	0	25	6.25	58	
1	.....	1	50	34	3	0.20		
		2	34	18	16	1.00		
		3	18	4	40	2.86		

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		4	4	0	35	8.75	94
1 1/2	....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	55	3.93	
		4	4	0	90	22.50	164
2	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	70	5.00	
		4	4	0	120	30.00	209
3	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	100	7.15	
		4	4	0	130	32.50	249
4	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	130	8.58	
		4	4	0	130	32.50	279
5	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	160	11.42	
		4	4	0	130	32.50	309
6	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	180	12.85	
		4	4	0	130	32.50	329

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-74501, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-745 (part), Appendix A (codified as WAC 296-155-74501), filed 5/7/74, effective 6/6/74.]

**PART R  
MISCELLANEOUS CONSTRUCTION  
REQUIREMENTS**

**WAC 296-155-755 Roofing, insulating and waterproofing.** (1) Roofers hoisting jack shall be constructed to withstand the contemplated load to be hoisted. The beam from counter balance point to heel of jack shall be at least 3/4 the length of the entire beam.

(2) Hoisting jack shall be counterweighted with a minimum of three times the contemplated maximum load to be lifted. Counterweight shall be securely fastened to heel of jack to prevent displacement, or the jack shall be fastened by means of lashing, bolting, or other means to prevent displacement.

(3) A steel collar or U-bolt and shackle on head of the hoisting jack shall be provided for attachment of pulley.

(4) Hoisting pulleys shall be of steel construction.

(5) Where materials are hoisted by hand the hoist line shall be not less than five-eighths manila rope, or the equivalent. Where machine hoist is used the hoist line shall be wire rope.

(6) Hoisting hooks shall be of cast or forged steel heavy enough to prevent straightening under a load.

(7) Workers shall not stand under load when material or hot asphalt is being hoisted.

(8) Hot asphalt shall be kept at a safe level in buckets for carrying and hoisting.

(9) Service buckets of hot asphalt shall not be carried up ladders by workers.

(10) Service buckets shall be standard safety bucket or flatbottom bucket with bails fastened to an offset ear firmly riveted to side of bucket. There shall be a handle riveted near bottom of bucket for tipping purposes.

(11) Ladders shall extend at least 3 feet above the platform or roof served and shall be secured at top and bottom to prevent slipping.

(12) Safeguards shall be erected to prevent loads and lines contacting power lines where not possible to work in clear of power lines.

(13) Asphalt chunks shall not be thrown into hot tar pot, but shall be placed so as to prevent splashing of hot material.

(14) There shall be means to smother fires at fired tar pots.

(15) Mop or spud bar handles over three feet long shall be of wood or other nonconductive material.

(16) Persons working at kettles or handling hot tar shall wear gloves and have arms fully protected.

(17) Open tar heating pots shall be kept outside of buildings.

Note: Electric type tar heating equipment may be used inside of the working enclosure provided that exhaust fans in connection with tubing, either rigid or flexible, capable of carrying fumes created by the heating process to the outside air are installed and in constant use during heating operations. The equipment should be provided with hinged lid or baffle plate for the purpose of immediate smothering of a pot fire.

(18) While hot tar is being applied inside an enclosure, exhaust fans to supplement natural ventilation shall be installed to expedite removal of gaseous fumes from the building.

(19) Flame heated tar pots shall be prohibited on roofs of structures.

(20) Tar pots shall have an attendant at all times while in operation.

[Order 74-26, § 296-155-755, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-765 Rock crushing, gravel washing, and hot mix plants.** (1) Stationary dragline machines shall have all moving parts which are exposed to contact guarded with standard safeguards.

(a) All running lines, straps, etc., shall be regularly inspected and shall be changed when 10% of the wires in a 3 foot length are broken.

(b) Spars shall be properly guyed with a minimum of 5 top guys and where spar is over 50 feet in height, 3 buckle guys shall be used.

(c) A pass line shall be rigged on the spar to provide safe means of reaching top of spar.

(d) The head block shall be equipped with a safety strap attached to shell of the block and onto a guy wire leading away from the working area.

(2) Truck dump bunkers shall have wheel bumper block installed when dumping material from trucks.

(3) Substantial walkways and working platforms, equipped with toe boards and handrails shall be installed at all plants. Standard stairways and ladders shall be placed to reach all parts requiring oiling and maintenance.

(4) Plant structures shall be constructed to carry the required load, without material or structural failure, for the prescribed life of the material used.

[Title 296 WAC—p. 2234]

(5) Bunker unloading devices shall be arranged to be operative from outside the walls of bunkers.

(6) Crusher operators and other employees working where hazardous dust or nuisance dust exists shall use approved respirators and goggles.

(7) All dusty rock crushing houses or other dusty places of employment, shall be equipped with means for controlling the dust.

(8) Cone type crushers shall be equipped with approved guards over or around the feed end to prevent rock from flying from crusher while in operation.

(9) All aggregate elevators, bucket or other type, shall have guards or barricades installed under or around return strand and of sufficient strength to sustain weight of piled up broken elevator equipment.

(10) All plant controls shall be placed so as to be readily accessible.

(11) Overhead conveyors shall be constructed so as to restrain the spillage of material. Wherever the hazard of falling materials exists, overhead protection shall be provided over walkways and roadways.

(12) Electrical equipment shall be installed and maintained to comply with the National Electrical Code.

(13) Exhaust fumes from internal combustion engines shall be discharged away from or above the working station.

(14) Hot mix plants, steam boilers and pressure vessels shall conform to A.S.M.E. Boiler and Pressure Vessel Codes and applicable rules and regulations of the department.

(15) All hot pipes exposed to contact shall be covered or otherwise guarded against contact.

(16) All oil tanks above ground shall be properly bedded and grounded.

(17) Oil leakage on the ground shall be cleaned up or covered with absorbent material.

(18) Mixer operators shall use approved respirator and goggles except when operating from a remote location.

(19) Dust and fume collection systems shall be provided on all installations. Dust and fumes shall be discharged back into plant or carried to a suitable distance from the work area and precipitated.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-765, filed 1/21/86; Order 74-26, § 296-155-765, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-770 Moving of structures.** (1) When structures are being raised, lowered, temporarily held in position or moved laterally, care shall be exercised to prevent the possibility of mishap.

(2) Weights to be moved shall be carefully computed and equipment furnished to provide a safety factor of five.

(3) Where excavations exist they shall be shored in compliance with Part N of this chapter.

(4) Cribbing and blocking shall be set on a level and firm foundation.

(5) Dollies and rollers shall be securely blocked except when structure is being moved by power equipment.

(6) Jacks shall comply with WAC 296-155-375 of this chapter.

(7) Provisions shall be made to maintain a minimum clearance of 10 feet from all electrical conductors with the following exceptions:

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(a) When a representative of the owner of the electrical conductors is present and directs the handling of all said conductors.

(b) Where there shall be existing and/or erected mechanical barriers to prevent contact of structure or workers with said electrical conductors. Barriers shall be installed by or under the direction of the owners of the conductors.

(c) Where said electrical conductors have been de-energized and grounded by the owners of the conductors.

(d) By relocation of said electrical conductors by the owners of the conductors. The 10 foot requirement shall not be reduced by movement due to strains being imposed upon the conductors or the structures supporting the conductors or upon any fixtures or attachments thereon.

(8) When a structure is being lifted, shoring shall be provided at all times and be kept up to the object until the desired height is reached, and then it shall be blocked or cribbed immediately.

(9) Timbers must be in sound condition and of a size sufficient to maintain not more than one inch deflection for each 200 inches of unsupported span.

(10) The cross member used on the front dolly, or the fifth wheel on the truck, must be of construction and size to preclude any deflection. All floor joists of the building being moved must be firmly supported on either the running members or on the cross members, which in turn ride on or are firmly attached to the running members.

(11) When timbers are used as the cross member, a steel saddle or cradle shall be used which will distribute the load evenly over the cross members, which in turn ride on or are firmly attached to the running members.

(12) When timbers are used as the cross member, a steel saddle or cradle shall be used which will distribute the load evenly over the cross sectional area of said timber where the timber is supported over the dolly or fifth wheel. This saddle or cradle shall be equipped so as to be interchangeable on any standard fifth wheel when such operation is used. Cross members of any other material used on fifth wheel loading shall also be so equipped.

(13) When running members are secured to the lower side of the cross member supported by the fifth wheel or front dolly, the primary support shall be 3/4 inch steel bolts placed one on either side of each member and spaced from such members by 1/2 inch steel plate shaped to act as a template for placement on the top of the cross member and beneath the running member. 3/4 by 3" nuts shall be used to tighten the above described clamp in a secure fashion. A secondary binding of chain or cable with chain binder or jacks shall be used to securely fasten the running members to cross members.

Note: Chains or cables securely tightened can be used. A secondary chain or safety chain should also be used in the event that the main chain should snap.

(14) Safety chains shall be used between the running members and the towing truck to supplant the tow bar, and will be secured so as to preclude any possibility of the running timbers being pulled off the cross members on the truck or from the dollies.

(15) For the purpose of computing weights to determine the axle and tire loadings, the cubic volume of the building (length, width and height), including walls, floors and ceiling

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joists, shall be used, allowing five pounds per cubic foot. This method of computing weight shall be used to determine if larger equipment need be employed on any given move.

(16) When fastening structures to tractor, and runners are clamped to headers, steel chains or the equivalent shall be used. If steel chains are used, said chains shall be tightened by railroad jacks or the equivalent.

(17) All motor vehicles shall conform with motor vehicle laws of the state of Washington.

(18) A fifth wheel type suspension with two nonsteering dollies shall be acceptable for moving buildings which do not exceed 46 feet in length. Permission to move larger structures with this type of suspension shall be obtained from the department.

(19) Pushing from the rear shall be prohibited unless a system of signals is used to control the driver.

(20) Blocks capable of holding the unit being moved shall be carried, and in case of winching operations, shall be kept close to the downhill side of the wheel of each dolly to prevent a runaway should the cable slip.

[Order 74-26, § 296-155-770, filed 5/7/74, effective 6/6/74.]

## PART S DEMOLITION

**WAC 296-155-775 Preparatory operations.** (1) Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a competent person, of the structure to determine structural integrity and the possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in writing, evidence that such a survey has been performed.

(2) A copy of the survey report and of the plans and/or methods of operations shall be maintained at the job site for the duration of the demolition operation.

(3) Any device or equipment such as scaffolds, ladders, derricks, hoists, etc., used in connection with demolition work shall be constructed, installed, inspected, maintained and operated in accordance with the regulations governing the construction, installation, inspection, maintenance and operation of such device or equipment as specified in other parts of this chapter.

(4) Federal and state codes, safety standards, rules, regulations, and ordinances governing any and all phases of demolition work shall be observed at all times.

(5) Demolition of all buildings and structures shall be conducted under competent supervision, and safe working conditions shall be afforded the employees.

(6) When employees are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

(7) All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company which is involved shall be notified in advance.

(8) If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

(9) It shall be determined whether asbestos, hazardous materials, hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances are present at the work site. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated before demolition is started. Removal of such substances shall be in accordance with the requirements of chapters 296-62 and 296-65 WAC.

(10) Where a hazard exists from fragmentation of glass, such hazards shall be removed.

(11) Where a hazard exists to employees falling through wall openings, the opening shall be protected to a height of between thirty-six and forty-two inches.

(12) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than forty-two inches high and not less than twenty feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(13) All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load which may be imposed. Such material shall be properly secured to prevent its accidental movement.

(14) Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

(15) Workers shall not be permitted to carry on a demolition operation which will expose persons working on a lower level to danger.

(16) Employee entrances to multistory structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of eight feet. All such canopies shall be at least two feet wider than the building entrances or openings (one foot wider on each side thereof), and shall be capable of sustaining a load of one hundred fifty pounds per square foot.

(17) Protruding nails in boards, planks and timber shall be withdrawn, driven in or bent over as soon as the same is removed from the structure being demolished.

(18) Any material to be removed which will cause dust to be formed, shall be sprinkled with water to lay the dust incidental to its removal.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-775, filed 7/20/94, effective 9/20/94; 87-24-051 (Order 87-24), § 296-155-775, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-775, filed 4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-775, filed 1/21/86; Order 74-26, § 296-155-775, filed 5/7/74, effective 6/6/74.]

#### **WAC 296-155-780 Stairs, passageways, and ladders.**

(1) Only those stairways, passageways, and ladders, designated as means of access to the structure of building, shall be

used. Other access ways shall be entirely closed off at all times.

(2) All stairs, passageways, ladders and incidental equipment thereto, which are covered by this section, shall be periodically inspected and maintained in a clean safe condition.

(3) All ladders shall be secured in position.

(4) In a multistory building, when a stairwell is being used, it shall be properly illuminated by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed. Access to the floor where the work is in progress shall be through a properly lighted, protected, and separate passageway.

[Order 74-26, § 296-155-780, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-785 Chutes.** (1) No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

(2) All materials chutes, or sections thereof, at an angle of more than 45° from the horizontal, shall be entirely enclosed, except for openings equipped with closures at or about floor level for the insertion of materials. The openings shall not exceed 48 inches in height measured along the wall of the chute. At all stories below the top floor, such openings shall be kept closed when not in use.

(3) A substantial gate shall be installed in each chute at or near the discharge end. A competent employee shall be assigned to control the operation of the gate, and the backing and loading of trucks.

(4) When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.

(5) Any chute opening, into which workers dump debris, shall be protected by a substantial guardrail between 36 and 42 inches above the floor or other surface on which the employees stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.

(6) Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toeboard or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each chute opening.

(7) Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-785, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-785, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-790 Removal of materials through floor openings.** Any openings cut in a floor for the disposal of materials shall be no larger in size than 25 percent of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place. Floors weakened or otherwise made unsafe by demolition operations shall be shored to carry safely the intended imposed load from demolition operations.

[Order 74-26, § 296-155-790, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-795 Removal of walls, masonry sections, and chimneys.** (1) Masonry walls, or other sections of masonry, shall not be permitted to fall upon the floors of the building in such masses as to exceed the safe carrying capacities of the floors.

(2) No wall section, which is more than one story in height, shall be permitted to stand alone without lateral bracing, unless such wall was originally designed and constructed to stand without such lateral support, and is in a condition safe enough to be self-supporting. All walls shall be left in a stable condition at the end of each shift.

(3) Employees shall not be permitted to work on the top of a wall when weather conditions constitute a hazard.

(4) Structural or load-supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. This provision shall not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment, provided that the requirements of WAC 296-155-790 and 296-155-800 are met.

(5) Floor openings within 10 feet of any wall being demolished shall be planked solid, except when employees are kept out of the area below.

(6) In buildings of "skeleton-steel" construction, the steel framing may be left in place during the demolition of masonry. Where this is done, all steel beams, girders, and similar structural supports shall be cleared of all loose material as the masonry demolition progresses downward.

(7) Walkways or ladders shall be provided to enable employees to safely reach or leave any scaffold or wall.

(8) Walls, which serve as retaining walls to support earth or adjoining structures, shall not be demolished until such earth has been properly braced or adjoining structures have been properly underpinned.

(9) Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load.

[Order 74-26, § 296-155-795, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-800 Manual removal of floors.** (1) Openings cut in a floor shall extend the full span of the arch between supports.

(2) Before demolishing any floor arch, debris and other material shall be removed from such arch and other adjacent floor area. Planks not less than 2 inches by 10 inches in cross section, full size undressed, shall be provided for, and shall be used by employees to stand on while breaking down floor arches between beams. Such planks shall be so located as to provide a safe support for the workers should the arch between the beams collapse. The open space between planks shall not exceed 16 inches.

(3) Safe walkways, not less than 18 inches wide, formed of planks not less than 2 inches thick if wood, or of equivalent strength if metal, shall be provided and used by workers when necessary to enable them to reach any point without walking upon exposed beams.

(4) Stringers of ample strength shall be installed to support the flooring planks, and the ends of such stringers shall be supported by floor beams or girders, and not by floor arches alone.

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(5) Planks shall be laid together over solid bearings with the ends overlapping at least 1 foot.

(6) When floor arches are being removed, employees shall not be allowed in the area directly underneath, and such an area shall be barricaded to prevent access to it.

(7) Demolition of floor arches shall not be started until they, and the surrounding floor area for a distance of 20 feet, have been cleared of debris and any other unnecessary materials.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-800, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-800, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-805 Removal of walls, floors, and material with equipment.** (1) Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are of sufficient strength to support the imposed load.

(2) Floor openings shall have curbs or stop-logs to prevent equipment from running over the edge.

(3) Mechanical equipment used shall meet the requirements specified in parts L and M of this chapter.

[Order 74-26, § 296-155-805, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-810 Catch platforms.** (1) During the demolition of the exterior walls of a structure originally more than seventy feet high, catch platforms shall be erected along the exterior faces of such walls where necessary to prevent injury to persons working below.

(2) Such catch platforms shall be constructed and maintained not more than three stories below the story from which the exterior walls are being removed, until the demolition has progressed to within three stories of the ground level.

(3) Catch platforms shall not be less than five feet in width measured in a horizontal distance from the face of the structure and constructed of outriggers and planks. Planks shall be laid tight together and without openings between the planks and the wall.

Note: Catch platforms may be constructed of other approved materials of equal strength and security against falling material.

(4) Catch platforms shall be capable of sustaining a uniform live load of not less than one hundred and twenty-five pounds per square foot.

[Order 74-26, § 296-155-810, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-815 Storage.** (1) The storage of waste material and debris on any floor shall not exceed the allowable floor loads.

(2) In buildings having wooden floor construction, the flooring boards may be removed from not more than one floor above grade to provide storage space for debris, provided falling material is not permitted to endanger the stability of the structure.

(3) When wood floor beams serve to brace interior walls or free-standing exterior walls, such beams shall be left in place until other equivalent support can be installed to replace them.

(4) Floor arches, to an elevation of not more than 25 feet above grade, may be removed to provide storage area for

debris: Provided, That such removal does not endanger the stability of the structure.

(5) Storage space into which material is dumped shall be blocked off, except for openings necessary for the removal of material. Such openings shall be kept closed at all times when material is not being removed.

[Order 74-26, § 296-155-815, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-820 Removal of steel construction. (1)**

When floor arches have been removed, planking in accordance with WAC 296-155-800(2) shall be provided for the workers engaged in razing the steel framing.

(2) Cranes, derricks, and other hoisting equipment used shall meet the requirements specified in part L of this chapter.

(3) Steel construction shall be dismantled column length by column length, and tier by tier (columns may be in two-story lengths).

(4) Any structural member being dismembered shall not be overstressed.

[Order 74-26, § 296-155-820, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-825 Mechanical demolition. (1)** No workers shall be permitted in any area, which can be adversely affected by demolition operations, when balling or clamming is being performed. Only those workers necessary for the performance of the operations shall be permitted in this area at any other time.

(2) The weight of the demolition ball shall not exceed 50 percent of the crane's rated load, based on the length of the boom and the maximum angle of operation at which the demolition ball will be used, or it shall not exceed 25 percent of the nominal breaking strength of the line by which it is suspended, whichever results in a lesser value.

(3) The crane boom and loadline shall be as short as possible.

(4) The ball shall be attached to the loadline with a swivel-type connection to prevent twisting of the loadline, and shall be attached by positive means in such manner that the weight cannot become accidentally disconnected.

(5) When pulling over walls or portions thereof, all steel members affected shall have been previously cut free.

(6) All roof cornices or other such ornamental stonework shall be removed prior to pulling walls over.

(7) During demolition, continuing inspections by a competent person shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material. No employee shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

[Order 74-26, § 296-155-825, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-830 Selective demolition by explosives.** Selective demolition by explosives shall comply with chapter 296-52 WAC.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-830, filed 1/21/86; Order 74-26, § 296-155-830, filed 5/7/74, effective 6/6/74.]

[Title 296 WAC—p. 2238]

**PART U  
POWER DISTRIBUTION AND TRANSMISSION  
LINES  
Refer to chapter 296-45 WAC, "Safety standards for  
electrical workers."**

**PART V  
ROLLOVER PROTECTIVE STRUCTURES AND  
OVERHEAD PROTECTION**

**WAC 296-155-950 Rollover protective structures (ROPS) for material handling equipment. (1)** Coverage.

(a) This section applies to the following types of material handling equipment: To all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in construction work. This requirement does not apply to sideboom pipelaying tractors.

(b) The promulgation of specific standards for rollover protective structures for compactors and rubber-tired skid-steer equipment is reserved pending consideration of standards currently being developed.

(2) Equipment manufactured on or after September 1, 1972, Material handling machinery described in subsection (1) of this section and manufactured on or after September 1, 1972, shall be equipped with rollover protective structures which meet the minimum performance standards prescribed in WAC 296-155-955 and 296-155-960, as applicable.

(3) Equipment manufactured before September 1, 1972.

(a) All material handling equipment described in subsection (1) of this section and manufactured or placed in service (owned or operated by the employer) prior to September 1, 1972, shall be fitted with rollover protective structures.

Machines manufactured before July 1, 1969; Reserved pending further study, development, and review.

(b) Rollover protective structures and supporting attachment shall meet the minimum performance criteria detailed in WAC 296-155-955 and 296-155-960, as applicable or shall be designed, fabricated, and installed in a manner which will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

(i) The design objective shall be to minimize the likelihood of a complete overturn and thereby minimize the possibility of the operator being crushed as a result of a rollover or upset.

(ii) The design shall provide a vertical clearance of at least 52 inches from the work deck to the ROPS at the point of ingress or egress.

(4) Remounting. ROPS removed for any reason, shall be remounted with equal quality, or better, bolts or welding as required for the original mounting.

(5) Labeling. Each ROPS shall have the following information permanently affixed to the structure:

(a) Manufacturer or fabricator's name and address;

(b) ROPS model number, if any;

(c) Machine make, model, or series number that the structure is designed to fit.

(6) Machines meeting certain existing governmental requirements. Any machine in use, equipped with rollover

(2007 Ed.)

protective structures, shall be deemed in compliance with this section if it meets the rollover protective structures requirements of the U.S. Army Corps of Engineers, or the Bureau of Reclamation of the U.S. Department of the Interior in effect on April 5, 1972. The requirements in effect are:

(a) U.S. Army Corps of Engineers: General Safety Requirements, EM-385-1-1 (March 1967).

(b) Bureau of Reclamation, U.S. Department of the Interior: Safety and Health Regulations for Construction, Part II (September 1971).

(7) ROPS meeting the criteria set forth in SAE J1040 a and SAE J1040 b shall be regarded as substantially meeting the requirements of this section, even if they do not meet all the criteria set forth in earlier criteria documents on which the present standard is based.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-950, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-950, filed 1/21/86; Order 76-29, § 296-155-950, filed 9/30/76; Order 74-26, § 296-155-950, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-955 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.** (1) Definitions. For purposes of this section, "vehicle weight" means the manufacturer's maximum weight of the prime mover for rubber-tired self-propelled scrapers. For other types of equipment to which this section applies, "vehicle weight" means the manufacturer's maximum recommended weight of the vehicle plus the heaviest attachment.

(2) General.

(a) This section prescribes minimum performance criteria for rollover protective structures (ROPS) for rubber-tired self-propelled scrapers; rubber-tired front-end loaders and rubber-tired dozers; crawler tractors, and crawler-type loaders, and motor graders. The vehicle and ROPS as a system shall have the structural characteristics prescribed in subsection (7) of this section for each type of machine described in this subsection.

(b) Equipment listed in subsection (2)(a) of this section may be exempted from the requirements for fitment of ROPS where it can be shown, to the satisfaction of the department, that the equipment will only be used where no rollover hazard will exist.

(3) The static laboratory test prescribed herein will determine the adequacy of the structures used to protect the operator under the following conditions:

(a) For rubber-tired self-propelled scrapers, rubber-tired front-end loaders, and rubber-tired dozers: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 30° maximum.

(b) For motor graders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to 360° down a slope of 30° maximum.

(c) For crawler tractors and crawler-type loaders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 45°.

(4) Facilities and apparatus.

(a) The following material is necessary:

(i) Material, equipment, and tiedown means adequate to ensure that the ROPS and its vehicle frame absorb the applied energy.

(ii) Equipment necessary to measure and apply loads to the ROPS. Adequate means to measure deflection and lengths should also be provided.

(iii) Recommended, but not mandatory, types of test setups are illustrated in Figure V-1 for all types of equipment to which this section applies; and in Figure V-2 for rubber-tired self-propelled scrapers; Figure V-3 for rubber-tired front-end loaders, rubber-tired dozers, and motor graders; and Figure V-4 for crawler tractors and crawler-type loaders.

(b) Table V-1 contains a listing of the required apparatus for all types of equipment described in subsection (2)(a) of this section.

TABLE V-1

<u>Means to measure</u>	<u>Accuracy</u>
Deflection of ROPS, inches	± 5% of deflection measured.
Vehicle weight, pounds	± 5% of the weight measured.
Force applied to frame, pounds	± 5% of force measured.
Dimensions of critical zone, inches.	± 0.5 in.

(5) Vehicle condition. The ROPS to be tested must be attached to the vehicle structure in the same manner as it will be attached during vehicle use. A totally assembled vehicle is not required. However, the vehicle structure and frame which support the ROPS must represent the actual vehicle installation. All normally detachable windows, panels, or nonstructural fittings shall be removed so that they do not contribute to the strength of the ROPS.

(6) Test procedure. The test procedure shall include the following, in the sequence indicated:

(a) Energy absorbing capabilities of ROPS shall be verified when loaded laterally by incrementally applying a distributed load to the longitudinal outside top member of the ROPS, as shown in Figure V-1, V-2 or V-3 as applicable. The distributed load must be applied so as to result in approximately uniform deflection of the ROPS. The load increments should correspond with approximately 0.5 in. ROPS deflection increment in the direction of the load application, measured at the ROPS top edge. Should the operator's seat be off center, the load shall be applied on the off center side. For each applied load increment, the total load (lb.) versus corresponding deflection (in.) shall be plotted, and the area under the load-deflection curve shall be calculated. This area is equal to the energy (in.-lb.) absorbed by the ROPS. For a typical load-deflection curve and calculation method, see Figure V-5.

Incremental loading shall be continued until the ROPS has absorbed the amount of energy and the minimum applied load specified under subsection (7) of this section has been reached or surpassed.

(b) To cover the possibility of the vehicle coming to rest on its top, the support capability shall be verified by applying a distributed vertical load to the top of the ROPS so as to result in approximately uniform deflection (see Figure V-1).

The load magnitude is specified in subsection (7)(b)(iii) of this section.

(c) The low temperature impact strength of the material used in the ROPS shall be verified by suitable material tests or material certification (see subsection (7)(b)(iv) of this section).

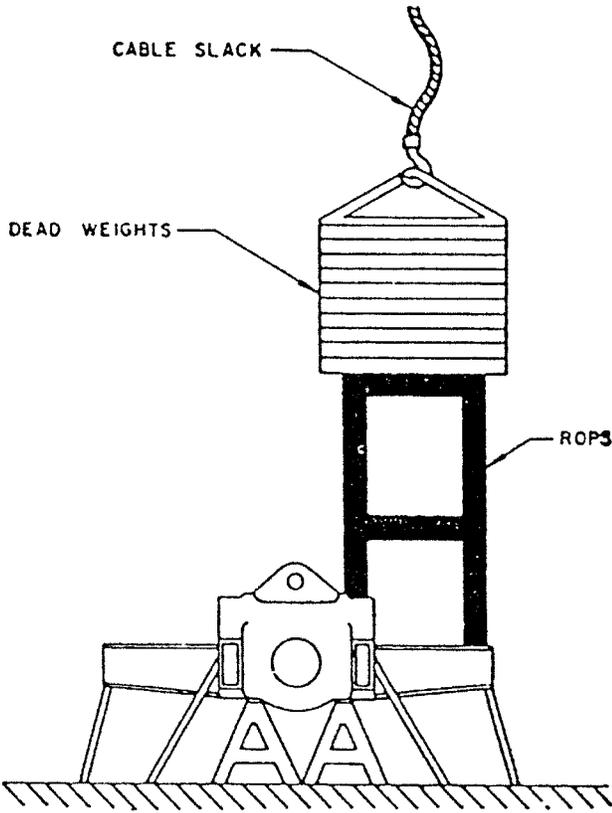


FIGURE V-1

Vertical loading setup for all types of equipment described in WAC 296-155-955(1).

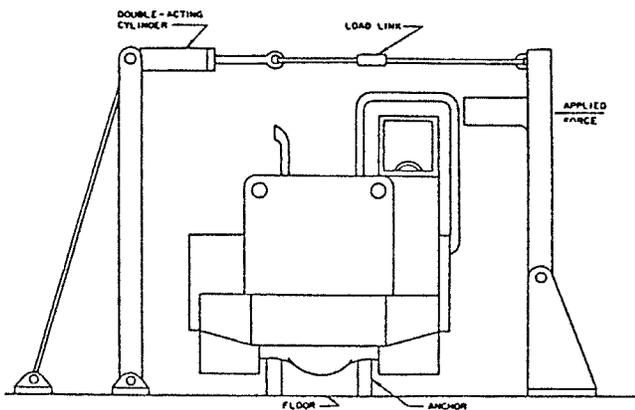


FIGURE V-2

Test setup for rubber-tired self-propelled scrapers.

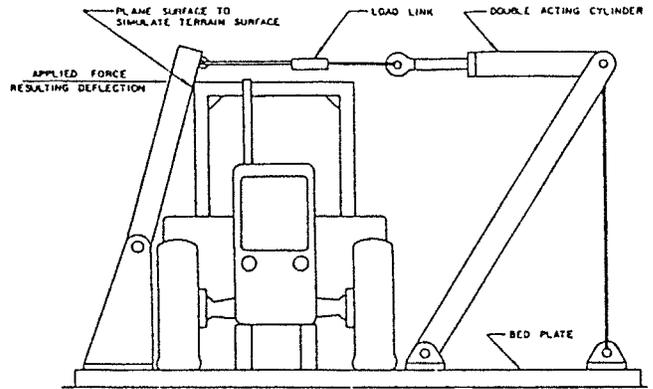


FIGURE V-3

Test setup for rubber-tired front-end loaders, rubber-tired dozers, and motor graders.

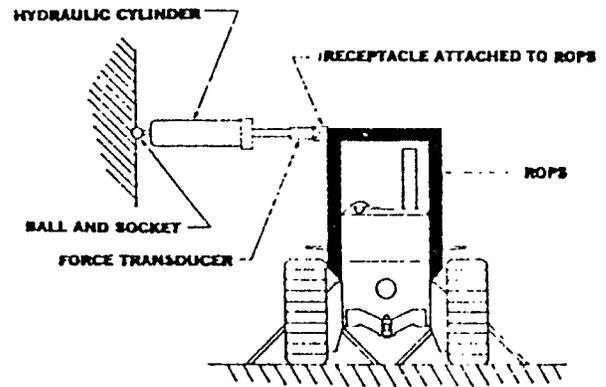
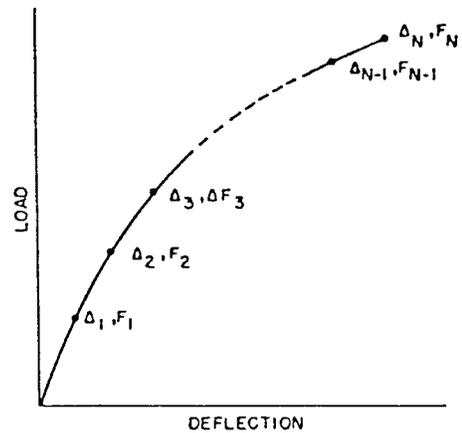


FIGURE V-4

Side-loading setup for crawler tractors and crawler loaders.



Δ - TOTAL DEFLECTION  
F - FORCE APPLIED

$$\text{AREA} = \frac{\Delta_1 F_1}{2} + (\Delta_2 - \Delta_1) \frac{F_1 + F_2}{2} + (\Delta_3 - \Delta_2) \frac{F_2 + F_3}{2} +$$

$$\dots + (\Delta_N - \Delta_{N-1}) \frac{F_{N-1} + F_N}{2}$$

FIGURE V-5

Determination of energy area under force deflection curve for all types of ROPS equipment defined in WAC 296-155-955.

(7) Performance requirements.

(a) General performance requirements.

(i) No repairs or straightening of any member shall be carried out between each prescribed test.

(ii) During each test, no part of the ROPS shall enter the critical zone as detailed in SAE J397 (1969). Deformation of the ROPS shall not allow the plane of the ground to enter this zone.

(b) Specific performance requirements.

(i) The energy requirement for purposes of meeting the requirements of subsection (6)(a) of this section is to be determined by referring to the plot of the energy versus weight of vehicle (see Figure V-6 for rubber-tired self-propelled scrapers; Figure V-7 for rubber-tired front-end loaders and rubber-tired dozers; Figure V-8 for crawler tractors and crawler-type loaders; and Figure V-9 for motor graders. For purposes of this section, force and weight are measured as pounds; energy (U) is measured as inch-pounds).

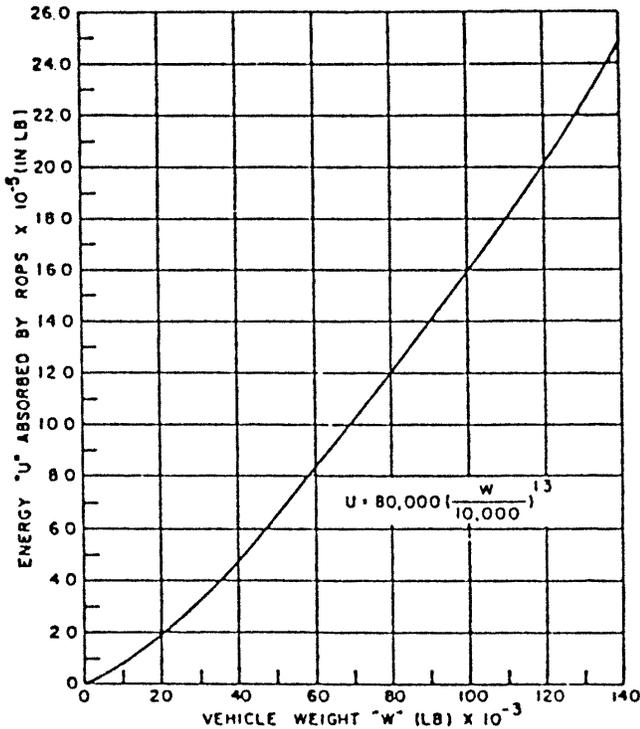


FIGURE V-6  
Energy absorbed versus vehicle weight.

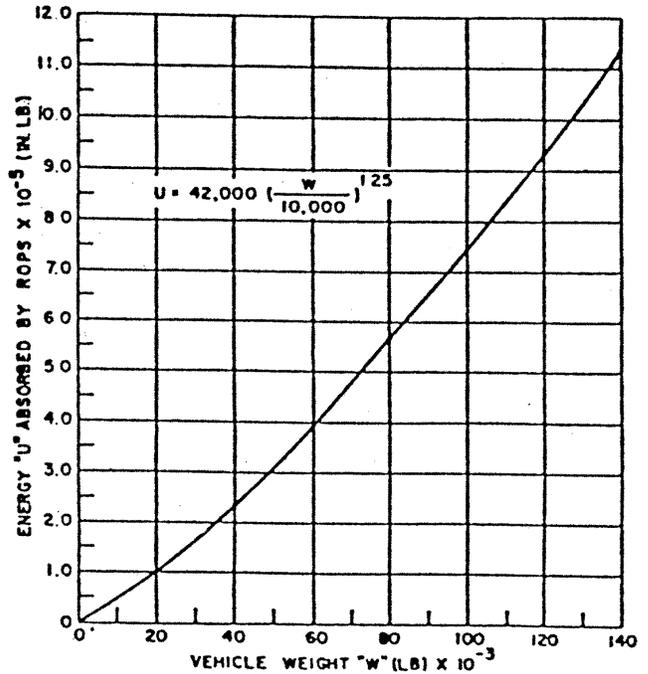


FIGURE V-7  
Energy absorbed versus vehicle weight.

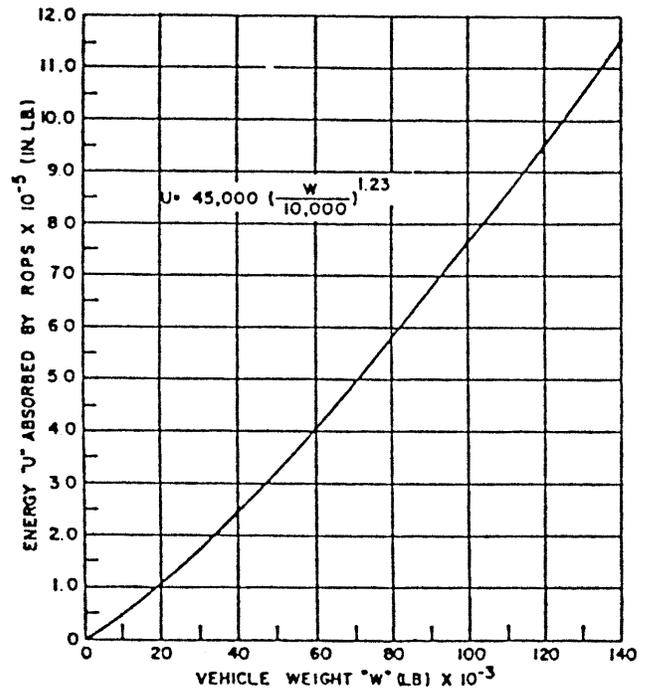


FIGURE V-8  
Energy absorbed versus vehicle weight.

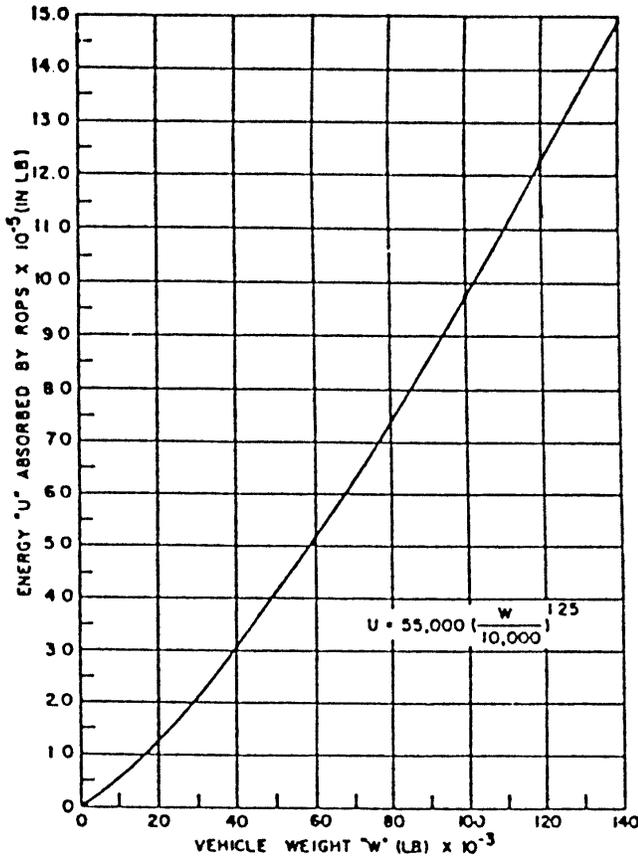


FIGURE V-9  
Energy absorbed versus vehicle weight.

(ii) The applied load must attain at least a value which is determined by multiplying the vehicle weight by the corresponding factor shown in Figure V-10 for rubber-tired self-propelled scrapers; in Figure V-11 for rubber-tired front-end loaders and rubber-tired dozers; in Figure V-12 for crawler tractors and crawler-type loaders; and in Figure V-13 for motor graders.

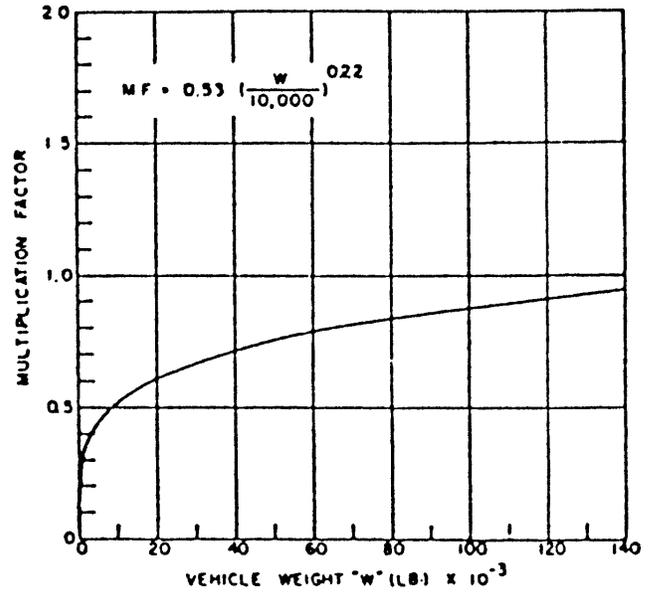


FIGURE V-11  
Minimum horizontal load factor for rubber-tired loaders and dozers.

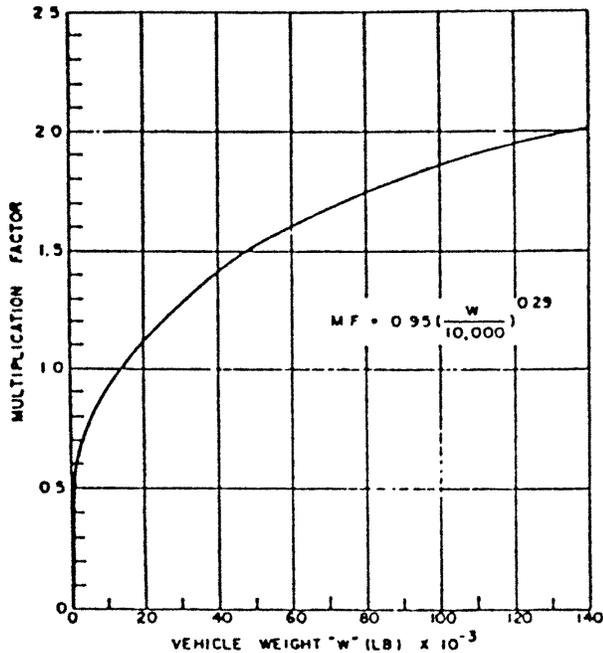


FIGURE V-10  
Minimum horizontal load factor for self-propelled scrapers.

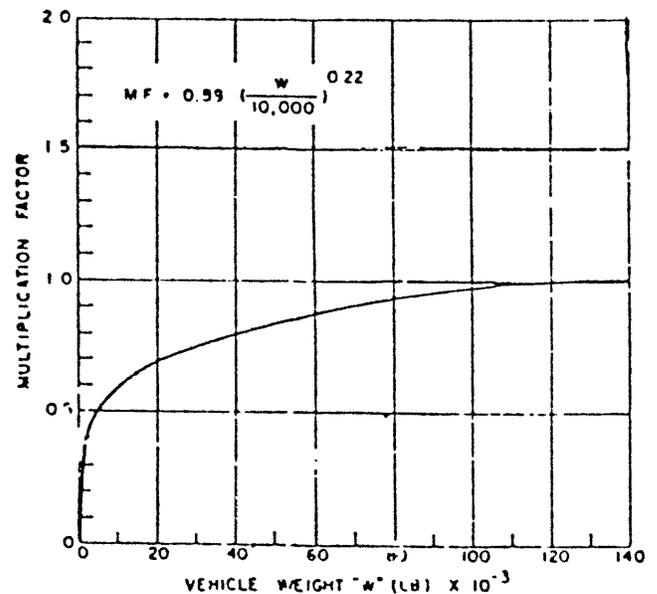


FIGURE V-12  
Minimum horizontal load factor for crawler tractors and crawler-type loaders.

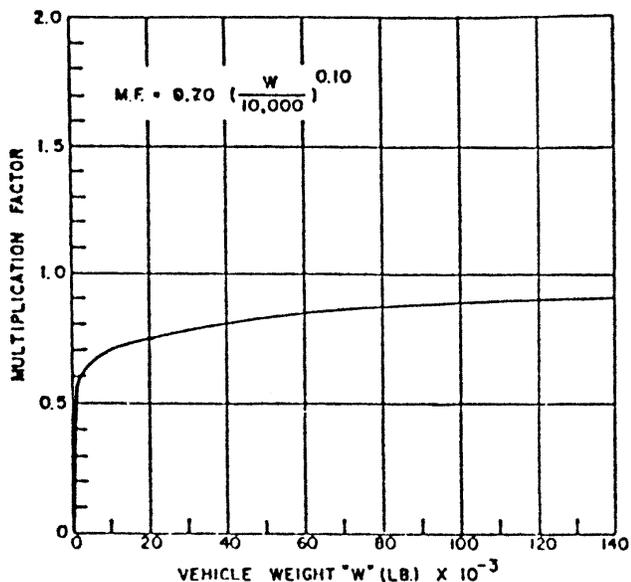


FIGURE V-13

Minimum horizontal load factor for motor graders.

(iii) The load magnitude for purposes of compliance with subsection (6)(b) of this section is equal to the vehicle weight. The test of load magnitude shall only be made after the requirements of subdivision (b)(i) of this subsection are met.

(iv) Material used in the ROPS must have the capability of performing at zero degrees Fahrenheit, or exhibit Charpy V notch impact strength of 8 foot-pounds at minus 20° Fahrenheit. This is a standard Charpy specimen as described in American Society of Testing and Materials A 370, Methods and Definitions for Mechanical Testing of Steel Products. The purpose of this requirement is to reduce the tendency of brittle fracture associated with dynamic loading, low temperature operation, and stress raisers which cannot be entirely avoided on welded structures.

(8) Source of standard. This standard is derived from, and restates, the following Society of Automotive Engineers Recommended Practices: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; and SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders. These recommended practices shall be resorted to in the event that questions of interpretation arise. The recommended practices appear in the 1971 SAE Handbook, which may be examined in each of the district offices of the department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-955, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-955, filed 5/7/74, effective 6/6/74.]

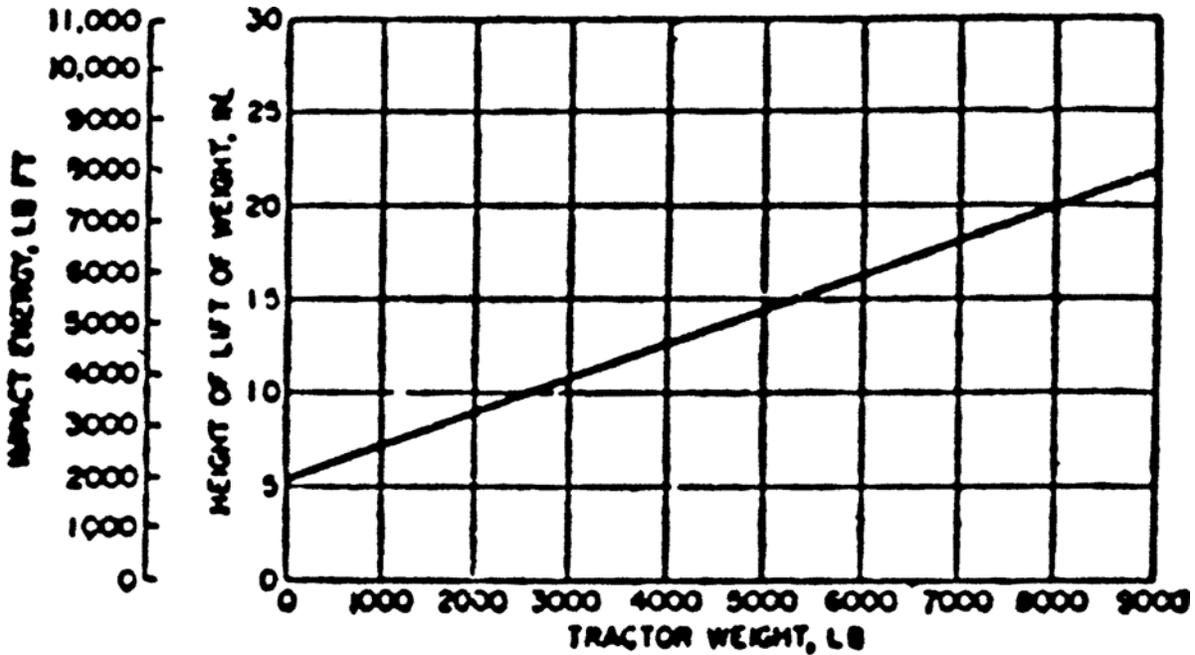
**WAC 296-155-960 Protective frame (ROPS) test procedures and performance requirements for wheel-type agricultural and industrial tractors used in construction.** (1) Definitions applicable to this section.

(a) SAE J333a, Operator Protection for Wheel-Type Agricultural and Industrial Tractors (July 1970) defines "agricultural tractor" as a "wheel-type vehicle of more than 20 engine horsepower designed to furnish the power to pull, carry, propel, or drive implements that are designed for agricultural usage." Since this chapter applies only to construction work, the following definition of "agricultural tractor" is adopted for purposes of this part: "Agricultural tractor" means a wheel-type vehicle of more than 20 engine horsepower, used in construction work, which is designed to furnish the power to pull, propel, or drive implements.

(b) "Industrial tractor" means that class of wheeled type tractor of more than 20 engine horsepower (other than rubber-tired loaders and dozers described in WAC 296-155-955), used in operations such as landscaping, construction services, loading, digging, grounds keeping, and highway maintenance.

(c) The following symbols, terms, and explanations apply to this section:

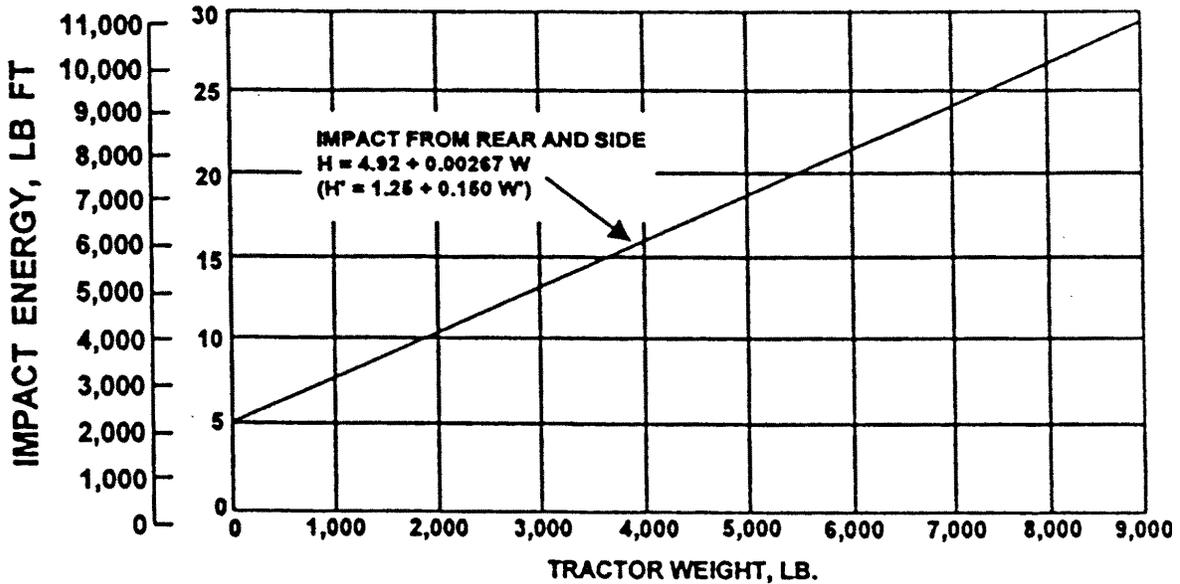
- $E_{is}$  = Energy input to be absorbed during side loading.  
 $E_{is} = 723 + 0.4 W$  ft.-lb. ( $E'_{is} = 100 + 0.12 W'$ , m.-kg).
- $E_{ir}$  = Energy input to be absorbed during rear loading.  $E_{ir} = 0.47 W$  ft.-lb. ( $E'_{ir} = 0.14 W'$ , m.-kg).
- $W$  = Tractor weight as prescribed in WAC 296-155-960 (5)(a) and (5)(c) in lb. ( $W'$ , kg).
- $L$  = Static load, lb. (kg.).
- $D$  = Deflection under  $L$ , in. (mm.).
- $L-D$  = Static load-deflection diagram.
- $L_m-D_m$  = Modified static load-deflection diagram (Figure V-20). To account for increase in strength due to increase in strain rate, raise  $L$  in plastic range to  $L \times K$ .
- $K$  = Increase in yield strength induced by higher rate of loading (1.3 for hot rolled low carbon steel 1010-1030). Low carbon is preferable; however, if higher carbon or other material is used,  $K$  must be determined in the laboratory. Refer to Charles H. Norris, et al., Structural Design for Dynamic Loads (1959), p. 3.
- $L_{max}$  = Maximum observed static load.
- Load = Point on  $L-D$  curve where observed static load is limit  $0.8 L_{max}$  (refer to Figure V-19).
- $E_u$  = Strain energy absorbed by the frame, ft.-lb. (m.-kg) area under  $L_m-D_m$  curve.
- FER = Factor of energy ratio,  $FER = E_u/E_{is}$ ; also =  $E_u/E_{ir}$ .
- $P_b$  = Maximum observed force in mounting connection under static load,  $L$ , lb. (kg.).
- FSB = Design margin for mounting connection  $FSB = (P_u/P_b)-1$ .
- $H$  = Vertical height of lift of 4,410 lb. (2,000 kg.) weight, in. ( $H'$ , mm.). The weight shall be pulled back so that the height of its center of gravity above the point of impact is defined as follows:  $H = 4.92 + 0.00190 W$  or ( $H' = 125 + 0.107 W'$ ) (Figure V-14).



NOTATION OF FORMULAE

$H = 4.92 + 0.00190 W$  OR  $(H' = 125 + 0.107 W')$

W = TRACTOR WEIGHT, AS DEFINED IN PARAGRAPH 33 IN POUNDS (W' IN KG)



NOTATION OF FORMULAE

H = HEIGHT OF LIFT OF WEIGHT IN IN. (H' IN MM)

W = UNBALLASTED WEIGHT OF TRACTOR IN LB (W' IN KG)

FIGURE V-14  
Impact energy and corresponding lift height of 4,410 lb. (2,000 kg.) weight.

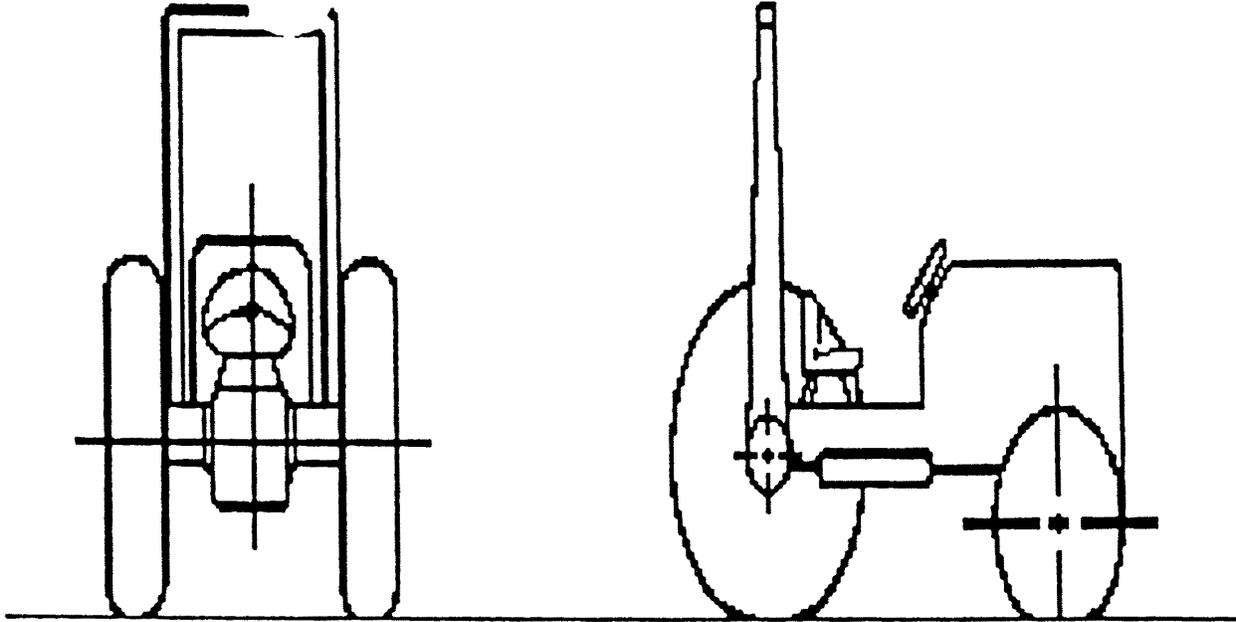
(d) Source of standard. The standard in this section is derived from, and restates, Society of Automotive Engineers Standard J334a (July 1970), Protective Frame Test Procedures and Performance Requirements. This standard must be used in the event that questions of interpretation arise. The standard appears in the 1971 SAE Handbook.

(2) General.

(a) The purpose of this section is to set forth requirements for frames for the protection of operators of wheel type

agricultural and industrial tractors to minimize the possibility of operator injury resulting from accidental upsets during normal operation. With respect to agricultural and industrial tractors, the provisions of WAC 296-155-955 and 296-155-965 for rubber-tired dozers and rubber-tired loaders may be utilized in lieu of the requirements of this section.

(b) The protective frame which is the subject of this standard is a structure mounted to the tractor that extends above the operator's seat and conforms generally to Figure V-15.



**FIGURE V-15**  
Typical frame configuration.

(c) If an overhead weather shield is attached to the protective frame, it may be in place during tests: Provided, That it does not contribute to the strength of the protective frame. If such an overhead weather shield is attached, it must meet the requirements of subsection (10) of this section.

(d) For overhead protection requirements, see WAC 296-155-965.

(e) If protective enclosures are used on wheel-type agricultural and industrial tractors, they shall meet the requirements of Society of Automotive Engineers Standard J168 (July 1970), Protective Enclosures, Test Procedures, and performance requirements.

(3) Applicability. The requirements of this section apply to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in construction work. See subsection (1) of this section for definitions of agricultural tractors and industrial tractors.

(4) Performance requirements.

(a) Either a laboratory test or a field test is required in order to determine the performance requirements set forth in subsection (10) of this section.

(b) A laboratory test may be either static or dynamic. The laboratory test must be under conditions of repeatable and controlled loading in order to permit analysis of the protective frame.

(c) A field upset test, if used, shall be conducted under reasonably controlled conditions, both rearward and sideways, to verify the effectiveness of the protective frame under actual dynamic conditions.

(5) Test procedure—General.

(a) The tractor used shall be the tractor with the greatest weight on which the protective frame is to be used.

(b) A new protective frame and mounting connections of the same design shall be used for each test procedure.

(c) Instantaneous and permanent frame deformation shall be measured and recorded for each segment of the test.

(d) Dimensions relative to the seat shall be determined with the seat unloaded and adjusted to its highest and most rearward latched position provided for a seated operator.

(e) If the seat is offset, the frame loading shall be on the side with the least space between the centerline of the seat and the upright.

(f) The low temperature impact strength of the material used in the protective structure shall be verified by suitable material tests or material certifications in accordance with WAC 296-155-955 (7)(b)(iv).

(6) Test procedure for vehicle overturn.

(a) Vehicle weight. The weight of the tractor, for purposes of this section, includes the protective frame, all fuels, and other components required for normal use of the tractor. Ballast must be added if necessary to achieve a minimum

total weight of 130 lb. (59 kg.) per maximum power takeoff horsepower at rated engine speed. The weight of the front end must be at least 33 lb. (15 kg.) per maximum power takeoff horsepower. In case power takeoff horsepower is unavailable, 95 percent of net engine flywheel horsepower shall be used.

(b) Agricultural tractors shall be tested at the weight set forth in subdivision (a) of this subsection.

(c) Industrial tractors shall be tested with items of integral or mounted equipment and ballast that are sold as standard equipment or approved by the vehicle manufacturer for use with the vehicle where the protective frame is expected to provide protection for the operator with such equipment installed. The total vehicle weight and front end weight as tested shall not be less than the weights established in subdivision (a) of this subsection.

(d) The test shall be conducted on a dry, firm soil bank as illustrated in Figure V-16. The soil in the impact area shall have an average cone index in the 0.6 in. (153 mm.) layer not less than 150 according to American Society of Agricultural Engineers Recommendations ASAE R313, Soil Cone Penetrometer. The path of travel of the vehicle shall be  $12^{\circ} \pm 2^{\circ}$  to the top edge of the bank.

(e) The upper edge of the bank shall be equipped with an 18 in. (457 mm.) high ramp as described in Figure V-16 to assist in tipping the vehicle.

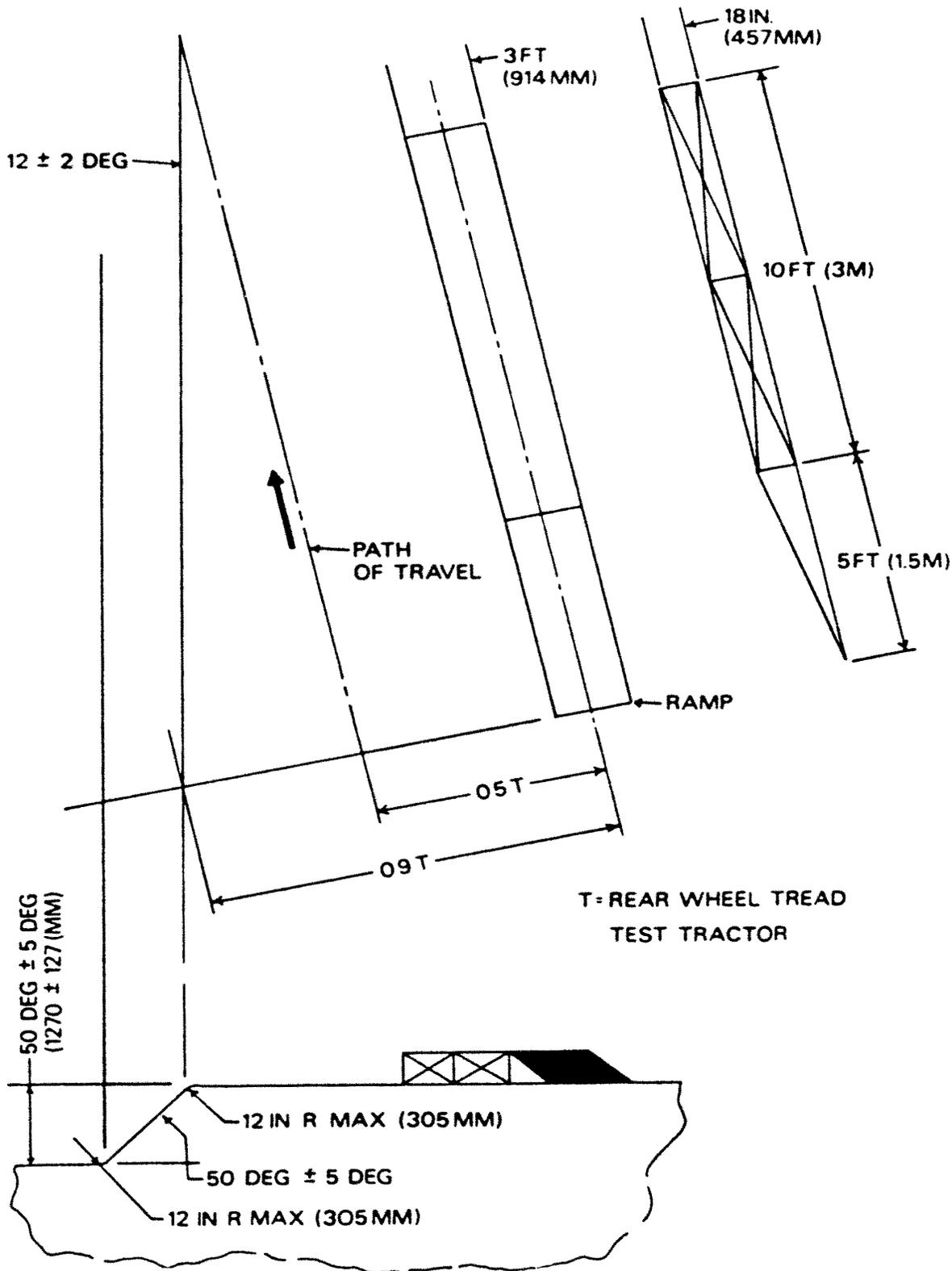
(f) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be used.

(g) Vehicle overturn test—Sideways and rearward.

(i) The tractor shall be driven under its own power along the specified path of travel at a minimum speed of 10 m.p.h. (16 km./hr.) or maximum vehicle speed if under 10 m.p.h. (16 km./hr.) up the ramp as described in subdivision (e) of this subsection to induce sideways overturn.

(ii) Rear upset shall be induced by engine power with the tractor operating in gear to obtain 3-5 m.p.h. (4.8-8 km./hr.) at maximum governed engine r.p.m. preferably by driving forward directly up a minimum slope of two vertical to one horizontal. The engine clutch may be used to aid in inducing the upset.

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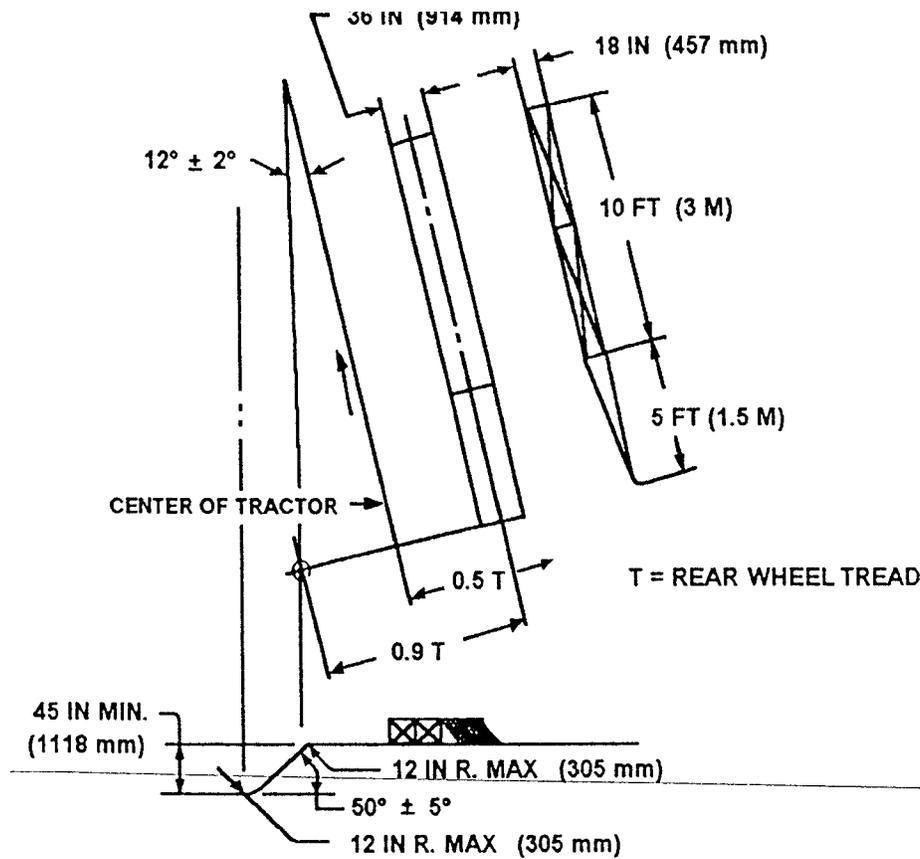


FIGURE V-16

(7) Other test procedures. When the field upset test is not used to determine ROPS performance, either the static test or the dynamic test, contained in subsection (8) or (9) of this section, shall be made.

(8) Static test.

(a) Test conditions.

(i) The laboratory mounting base shall include that part of the tractor chassis to which the protective frame is attached including the mounting parts.

(ii) The protective frame shall be instrumented with the necessary equipment to obtain the required load deflection data at the locations and directions specified in Figures V-17, V-18, and V-19.

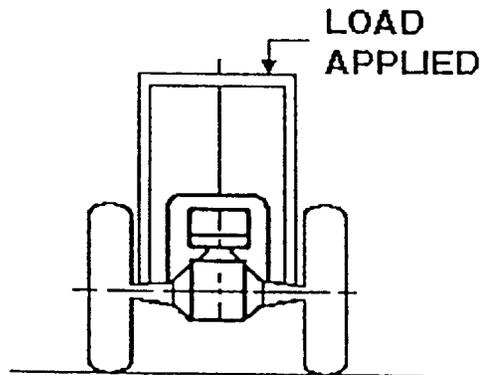
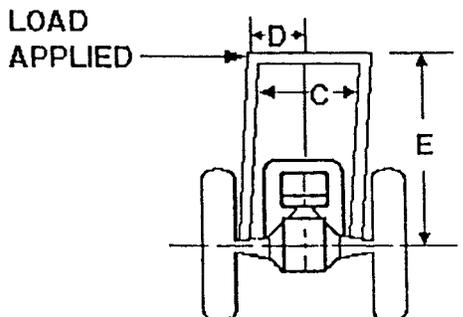


FIGURE V-17  
Side load application.



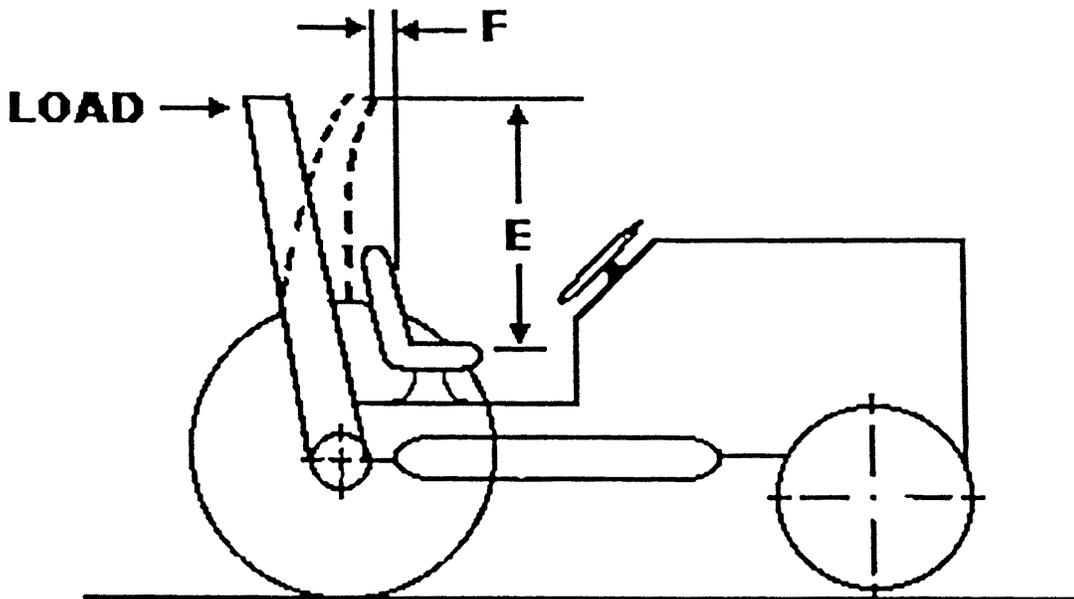


FIGURE V-18  
Rear load application.

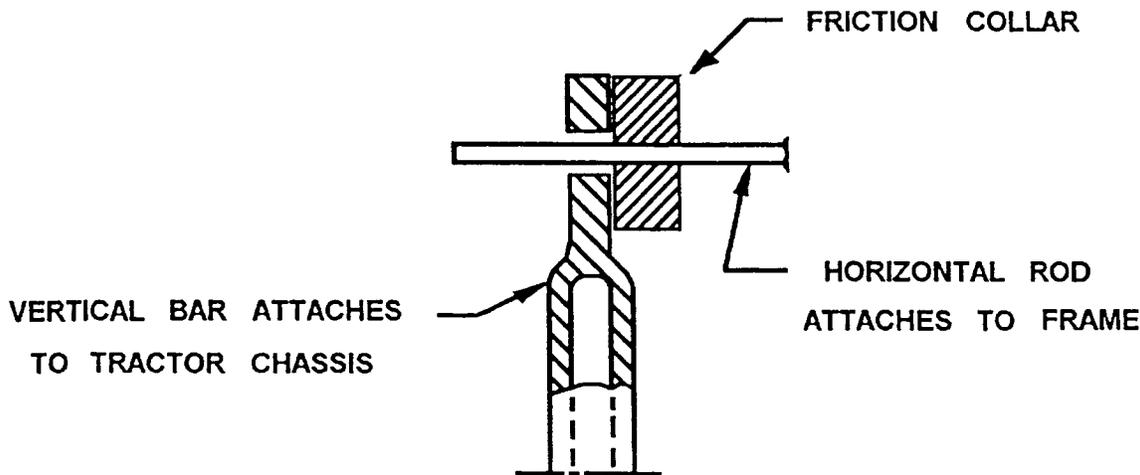


FIGURE V-19  
Method of measuring instantaneous deflection.

(iii) The protective frame and mounting connections shall be instrumented with the necessary recording equipment to obtain the required load-deflection data to be used in calculating FSB (see subsection (1)(c) of this section). The gauges shall be placed on mounting connections before the installation load is applied.

(b) Test procedure.

(i) The side load application shall be at the upper extremity of the frame upright at a 90° angle to the centerline of the vehicle. The side load "L" shall be applied according to Figure V-17. "L" and "D" shall be recorded simultaneously. The test shall be stopped when:

(a) The strain energy absorbed by the frame is equal to the required input energy ( $E_{is}$ ) or

(b) Deflection of the frame exceeds the allowable deflection, or

(c) The frame load limit occurs before the allowable deflection is reached in the side load.

(ii) The L-D diagram, as shown by means of a typical example in Figure V-20, shall be constructed, using the data obtained in accordance with item (i) of this subdivision.

(iii) The modified  $L_m$ - $D_m$  diagram shall be constructed according to item (ii) of this subdivision and according to Figure V-21. The strain energy absorbed by the frame ( $E_u$ ) shall then be determined.

(iv)  $E_{is}$ , FER and FSB shall be calculated.

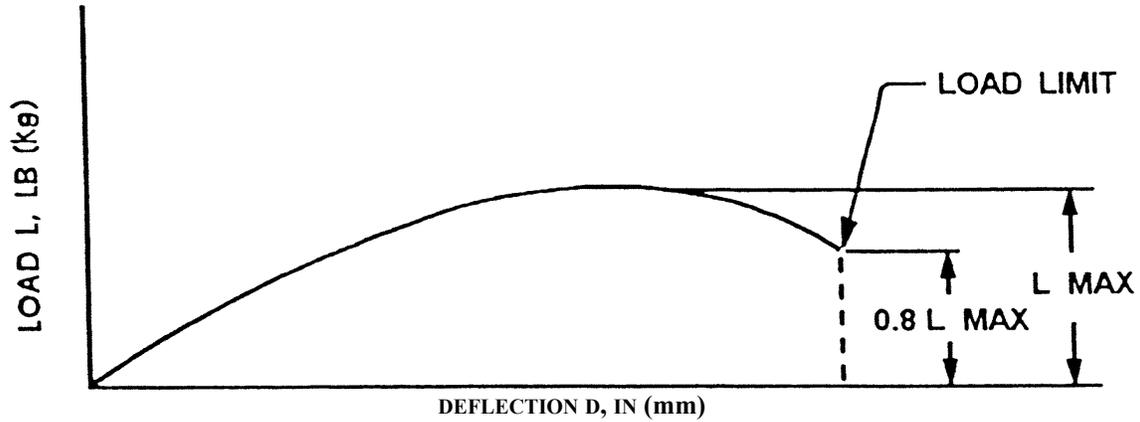


FIGURE V-20  
Typical L-D diagram.

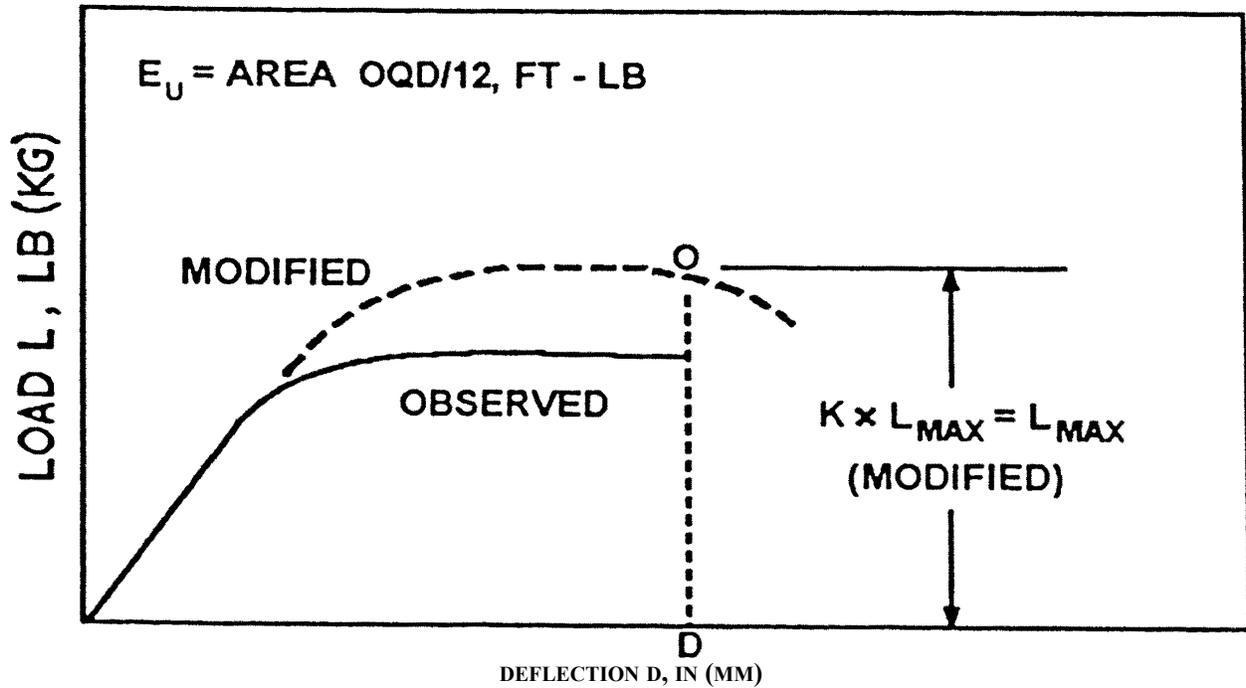


FIGURE V-21  
Typical modified  $L_m$ - $D_m$  diagram.

(v) The test procedure shall be repeated on the same frame utilizing  $L$  (rear input; see Figure V-19) and  $E_{ir}$ . Rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 sq. in. (1,032 sq. cm.) normal to the direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(9) Dynamic test.

(a) Test conditions.

(i) The protective frame and tractor shall meet the requirements of subsection (6)(b) or (c) of this section, as appropriate.

(ii) The dynamic loading shall be produced by use of a 4,410 lb. (2,000 kg.) weight acting as a pendulum. The

impact face of the weight shall be 27 plus or minus 1 in. by 27 plus or minus 1 in. (686 + or - 25 mm.) and shall be constructed so that its center of gravity is within 1 in. (25.4 mm.) of its geometric center. The weight shall be suspended from a pivot point 18-22 ft. (5.5-6.7 m.) above the point of impact on the frame and shall be conveniently and safely adjustable for height. (See Figure V-22.)

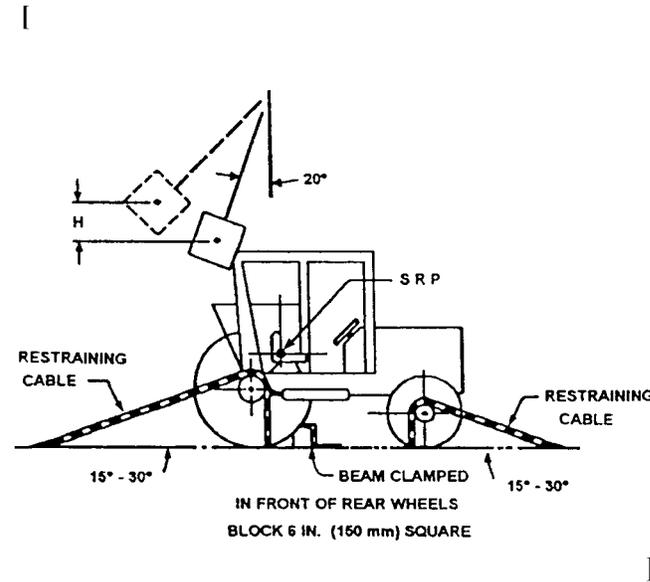
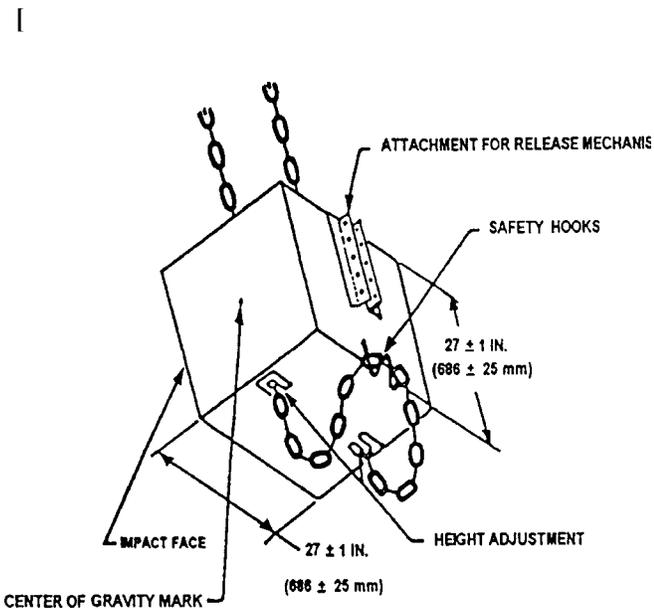
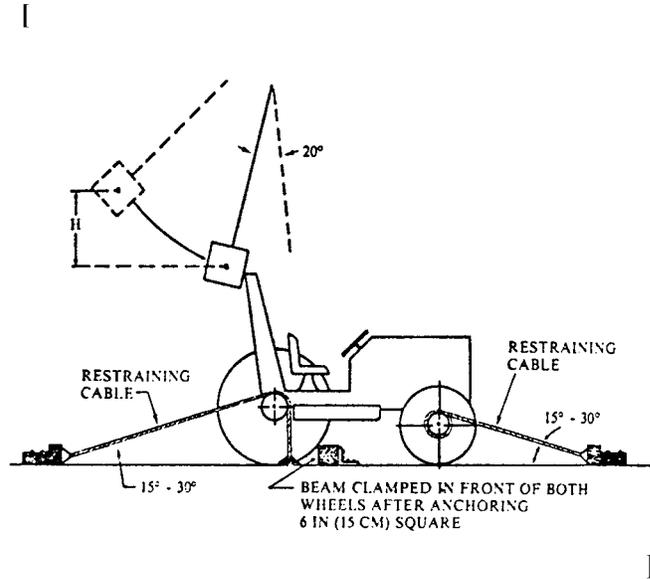
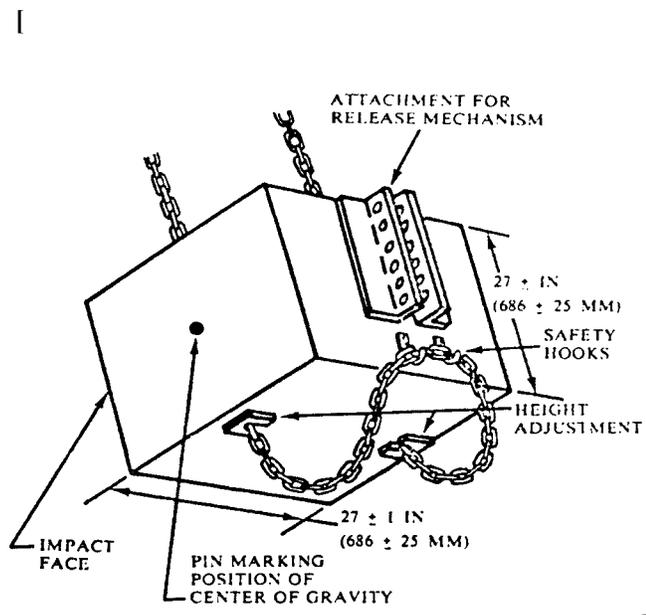


FIGURE V-22  
Pendulum.

FIGURE V-23  
Method of impact from rear.

(iii) For each phase of testing, the tractor shall be restrained from moving when the dynamic load is applied. The restraining members shall be of 0.5-0.63 in. (12.5-16 mm.) steel cable and points of attaching restraining members shall be located an appropriate distance behind the rear axle and in front of the front axle to provide a 15°-30° angle between a restraining cable and the horizontal. The restraining member shall either be in the plane in which the center gravity of the pendulum will swing or more than one restraining cable shall give a resultant force in this plane. (See Figure V-23.)

(iv) The wheel tread setting shall comply with the requirements of subsection (6)(f) of this section. The tires shall have no liquid ballast and shall be inflated to the maximum operating pressure recommended by the tire manufacturer. With specified tire inflation, the restraining cables shall be tightened to provide tire deflection of 6-8 percent of nominal tire section width. After the vehicle is properly restrained, a wooden beam 6 x 6 in. (15 x 15 cm.) shall be driven tightly against the appropriate wheels and clamped. For the test to the side, an additional wooden beam shall be placed as a prop against the wheel nearest the operator's station and shall be secured to the floor so that it is held tightly against the wheel rim during impact. The length of this beam shall be chosen so that when it is positioned against the wheel rim it is at an angle of 25°-40° to the horizontal. It shall have a length 20-25 times its depth and a width two to three times its depth. (See Figures V-23 and V-24.)

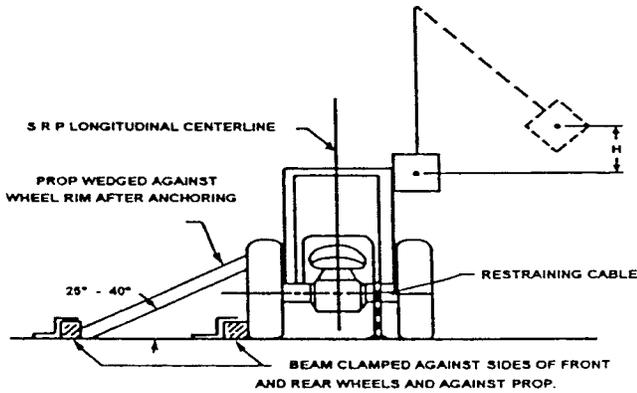


FIGURE V-24  
Method of impact from side.

(v) Means shall be provided indicating the maximum instantaneous deflection along the line of impact. A simple friction device is illustrated in Figure V-24.

(vi) No repair or adjustments may be carried out during the test.

(vii) If any cables, props, or blocking shift or break during the test, the test shall be repeated.

(b) Test procedure.

(i) General. The frame shall be evaluated by imposing dynamic loading to rear followed by a load to the side on the same frame. The pendulum dropped from the height (see definition "H" in subsection (1)(c) of this section) imposes the dynamic load. The position of the pendulum shall be so selected that the initial point of impact on the frame shall be in line with the arc of travel of the center of gravity of the pendulum. A quick release mechanism should be used but, if used, shall not influence the attitude of the block.

(ii) Impact at rear. The tractor shall be properly restrained according to subdivisions (a)(iii) and (iv) of this section. The tractor shall be positioned with respect to the pivot point of the pendulum such that the pendulum is 20° from the vertical prior to impact, as shown in Figure V-23. The impact shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright of a new frame.

(iii) Impact at side. The block and restraining shall conform to subdivisions (a)(iii) and (iv) of this subsection. The point of impact shall be that structural member of the protective frame likely to hit the ground first in a sideways accidental upset. The side impact shall be applied to the side opposite that used for rear impact.

(10) Performance requirements.

(a) General.

(i) The frame, overhead weather shield, fenders, or other parts in the operator area may be deformed but shall not shatter or leave sharp edges exposed to the operator, or violate dimensions as shown in Figures V-17 and V-18 as follows:

D = 2 in. (51 mm.) inside of frame upright to vertical centerline of seat.

E = 30 in. (762 mm.).

F = Not less than 0 in. and not more than 12 in. (305 mm.), measured at centerline front of seat backrest to crossbar along the line of load application as shown in Figure V-17.

G = 24 in. (610 mm.).

(ii) The material and design combination used in the protective structure must be such that the structure can meet all prescribed performance tests at zero degrees Fahrenheit in accordance with WAC 296-155-955 (7)(b)(iv).

(b) Vehicle overturn performance requirements. The requirements of this subsection (10) must be met in both side and rear overturns.

(c) Static test performance requirements. Design factors shall be incorporated in each design to withstand an overturn test as prescribed in this subsection (10). The structural requirements will be generally met if FER is greater than 1 and FSB is greater than K-1 in both side and rear loadings.

(d) Dynamic test performance requirements. Design factors shall be incorporated in each design to withstand the overturn test prescribed in this subsection (10). The structural requirements will be generally met if the dimensions in this subsection (10) are adhered to in both side and rear loads.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, 02-12-098, § 296-155-960, filed 6/5/02, effective 8/1/02; Order 74-26, § 296-155-960, filed 5/7/74, effective 6/6/74.]

**Reviser's note:** RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

**WAC 296-155-965 Overhead protection for operators of agricultural and industrial tractors. (1) General.**

(a) Purpose. When overhead protection is provided on wheel-type agricultural and industrial tractors, the overhead protection shall be designed and installed according to the requirements contained in this section. The provisions of WAC 296-155-955 for rubber-tired dozers and rubber-tired loaders may be used in lieu of the standards contained in this section. The purpose of the standard is to minimize the possibility of operator injury resulting from overhead hazards such as flying and falling objects, and at the same time to minimize the possibility of operator injury from the cover itself in the event of accidental upset.

(b) Applicability. This section applies to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in construction work. See WAC 296-155-960 (1) and (3). In the case of machines to which WAC 296-155-625 (relating to site clearing) also applies, the overhead protection may be either the type of protection provided in WAC 296-155-625 or the type of protection provided by this section.

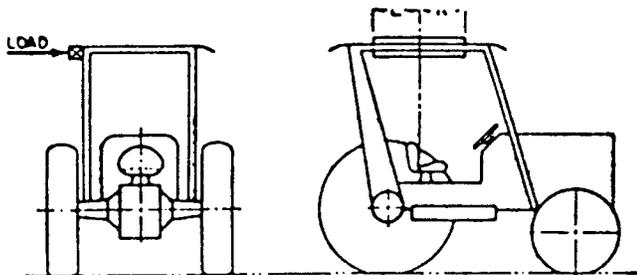
(2) Overhead protection. When overhead protection is installed on wheel-type agricultural or industrial tractors used in construction work, it shall meet the requirements of this subsection. The overhead protection may be constructed of a solid material. If grid or mesh is used, the largest permissible opening shall be such that the maximum circle which can be inscribed between the elements of the grid or mesh is 1.5 in. (38 mm.) in diameter. The overhead protection shall not be installed in such a way as to become a hazard in the case of upset.

(3) Test procedures—General.

(a) The requirements of WAC 296-155-960 (5), (6) and (7) shall be met.

(b) Static and dynamic rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.<sup>2</sup> (1,032 cm.<sup>2</sup>) normal direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(c) The static and dynamic side load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.<sup>2</sup> (1,032 cm.<sup>2</sup>) normal to the direction of load application. The direction of load application is the same as in WAC 296-155-960 (8) and (9). To simulate the characteristics of the structure during an upset, the center of load application may be located from a point 24 in. (610 mm.) (K) forward to 12 in. (305 mm.) (K) forward to 12 in. (305 mm.) (L) rearward of the front of the seat backrest to best utilize the structural strength. See Figure V-25.



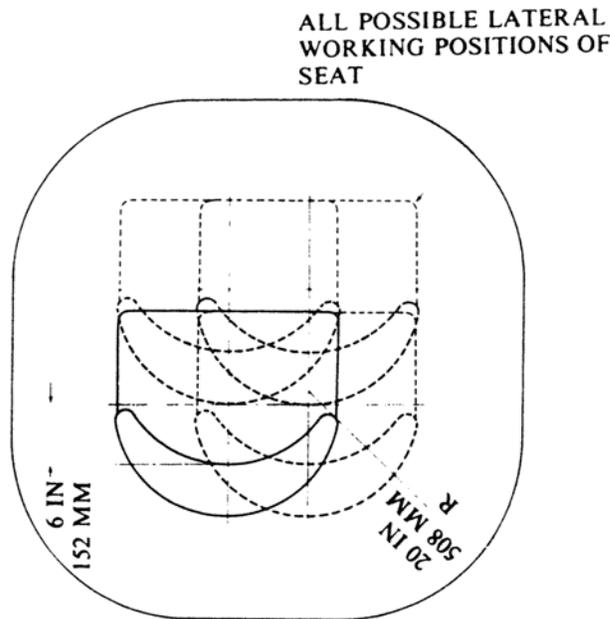
**FIGURE V-25**  
Location for side load.

(4) Drop test procedures.

(a) The same frame shall be subjected to the drop test following either the static or dynamic test.

(b) A solid steel sphere or material of equivalent spherical dimension weighing 100 lb. (45.4 kg.) shall be dropped once from a height 10 ft. (3,048 mm.) above the overhead cover.

(c) The point of impact shall be on the overhead cover at a point within the zone of protection as shown in Figure V-26, which is furthest removed from major structural members.

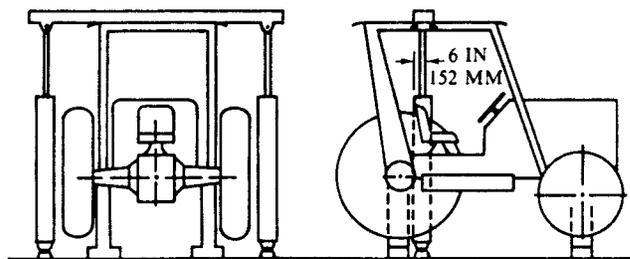


**FIGURE V-26**  
Zone of protection for drop test.

(5) Crush test procedure.

(a) The same frame shall be subjected to the crush test following the drop test and static or dynamic test.

(b) The test load shall be applied as shown in Figure V-27 with the seat positioned as specified in WAC 296-155-960 (5)(d). Loading cylinders shall be pivotally mounted at both ends. Loads applied by each cylinder shall be equal within 2 percent, and the sum of the loads of the two cylinders shall be two times the tractor weight as set forth in WAC 296-155-960 (6)(a). The maximum width of the beam illustrated in Figure V-27 shall be 6 in. (152 mm.).



**FIGURE V-27**  
Method of load application for crush test.

(6) Performance requirements.

(a) General. The performance requirements set forth in WAC 296-155-960 (10)(b), (c) and (d) shall be met.

(b) Drop test performance requirements.

(i) Instantaneous deformation due to impact of the sphere shall not enter the protected zone as illustrated in Figures V-25, V-26, and V-28.

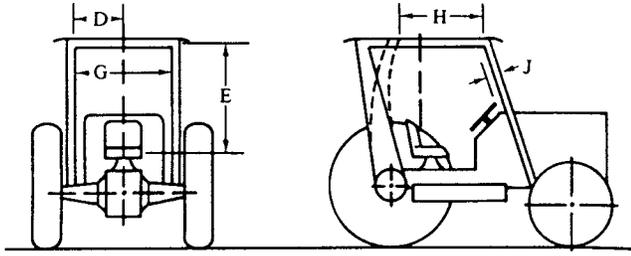


FIGURE V-28

Protected zone during crush and drop tests.

(ii) In addition to the dimensions set forth in WAC 296-155-960 (10)(a)(i) the following dimensions apply to Figure V-28:

- H = 17.5 in. (444 mm.).
- J = 2 in. (50.8 mm.) measured from the outer periphery of the steering wheel.

(c) Crush test performance requirements. The protected zone as described in Figure V-28 must not be violated.

(7) Source of standard. This standard is derived from, and restates, the portions of Society of Automotive Engineers Standard J167 which pertain to overhead protection requirements. The full title of the SAE standard is: Protective Frame with Overhead Protection—Test Procedures and performance requirements. The SAE standard shall be resorted to in the event that questions of interpretation arise. The SAE standard appears in the 1971 SAE Handbook.

[Order 74-26, § 296-155-965, filed 5/7/74, effective 6/6/74.]

**Chapter 296-200A WAC**

**CONTRACTOR CERTIFICATE OF REGISTRATION RENEWALS—SECURITY—INSURANCE**

<b>WAC</b>	
296-200A-005	What is the goal of this chapter?
296-200A-015	What terms do I need to know to understand this chapter?
296-200A-025	How does a contractor register, renew, reregister or reinstate its registration?
296-200A-030	How much are the surety bond or savings account amounts?
296-200A-035	How long is a contractor's registration period?
296-200A-040	What can cause the suspension of a contractor's registration?
296-200A-050	What requirements must be met if a contractor changes its business structure, name or address?
296-200A-060	What procedures must be followed when surety bonds and/or insurance policies are canceled?
296-200A-065	What procedures must be followed when surety bonds and/or other securities approved by the department become impaired?
296-200A-070	When will the department release a security deposit?
296-200A-080	How is a suit filed against a contractor?
296-200A-090	How are judgments against contractors paid?
296-200A-110	Is a city, town, or county required to verify a contractor registration number?
296-200A-111	How does a city, town, or county verify a contractor's registration?
296-200A-112	Who is liable when a city, town, or county fails to verify a contractor's registration?
296-200A-300	What violations of chapter 18.27 RCW can result in the issuance of a notice of infraction?
296-200A-305	How does the department notify registered contractors regarding any unregistered subcontractors they may employ?

296-200A-310	What information must be included in a notice of infraction?
296-200A-320	How can a notice of infraction be served?
296-200A-330	How are notices of infraction issued?
296-200A-340	How does a contractor appeal a notice of infraction?
296-200A-350	Who presides over an appeal hearing and where is it held?
296-200A-360	Who may represent the contractor and the department at the appeal hearing?
296-200A-370	How is the appeal hearing conducted?
296-200A-380	What evidence is admissible in an appeal hearing?
296-200A-390	What does the department do with the appeal notices that they receive?
296-200A-400	What monetary penalties will be assessed for an infraction issued for violations of RCW 18.27.100, 18.27.110, 18.27.114 or 18.27.200?
296-200A-405	When must a contractor pay assessed monetary penalties?
296-200A-900	What fees does the department charge contractors for issuance, renewal, reregistration, and reinstatement of certificates of registration?

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

296-200A-500	Is the department required to monitor unregistered contractors who become registered? [Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-500, filed 12/2/97, effective 1/5/98.] Repealed by 03-20-097, filed 9/30/03, effective 11/17/03. Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125 and 2001 c 159, and chapter 18.27 RCW.
296-200A-510	Is the department required to report contractor compliance activities to the legislature? [Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-510, filed 12/2/97, effective 1/5/98.] Repealed by 03-20-097, filed 9/30/03, effective 11/17/03. Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW.

**WAC 296-200A-005 What is the goal of this chapter?**

The goal of this chapter is to:

- (1) Reduce the paperwork required for contractor registrations.
- (2) Clarify issues related to suits against contractors and the collection of court judgments.
- (3) Ensure that the contractors registration law (chapter 18.27 RCW) is efficiently and properly administered.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-005, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-015 What terms do I need to know to understand this chapter?** For the purposes of this chapter, the following terms and definitions are important:

**"Administrative law judge"** is any person appointed by the chief administrative law judge (as defined in RCW 34.12.020(2)) to preside at a notice of infraction appeal hearing convened under chapter 18.27 RCW and this chapter.

**"Appeal hearing"** is any proceeding in which an administrative law judge is empowered to determine legal rights, duties or privileges of specific parties on behalf of the director.

**"Applicant"** is any person, firm, corporation or other entity applying to become a registered contractor according to chapter 18.27 RCW and this chapter. Applicant includes all principal officer(s), members, partners of a partnership, firm, corporation, or other entity named on the application.

**"Citation"** means the same as "infraction."

**"Compliance inspector"** refers to the departmental staff responsible for investigating potential violations of chapter 18.27 RCW and this chapter.

**"Contractor compliance chief"** refers to the person designated by the director to address all policy and technical issues related to chapter 18.27 RCW and this chapter.

**"Department"** refers to the department of labor and industries.

**"Director"** refers to the director of the department of labor and industries or the director's designee acting in the place of the director.

**"Final judgment"** means any money that is owed to a claimant as a result of court action against a contractor's bond or assigned savings account with the department or any money that is owed the department as a result of a contractor's unsuccessful appeal of an infraction. Final judgment also includes any penalties assessed against the contractor and owed the department as a result of an unappealed infraction or any outstanding fees due under this chapter.

**"Infraction"** means a violation of chapter 18.27 RCW and this chapter as cited by the chief contractor compliance inspector or the department's construction compliance inspectors.

**"Renewal"** or **"renewed"** means the renewal of a contractor's registration before it expires.

**"Reinstatement"** or **"reinstated"** means the reinstatement of a contractor's registration after the registration has expired, been suspended, or been revoked.

**"Reregistration"** or **"reregister"** means an update to a contractor's registration because of business structure change.

**"Secured contractor"** is a contractor who has complied with RCW 18.27.040 by assigning to the department a savings account held in a Washington state bank, or by filing with the department a surety bond.

**"Security"** is a savings account held in a Washington state bank and assigned to the department in lieu of a surety bond.

**"Unregistered contractor"** means a person, firm, corporation or other entity working as a contractor without being registered in compliance with chapter 18.27 RCW and this chapter.

**"Unsatisfied final judgment"** means a judgment that has not been satisfied either through payment, court approved settlement, discharge in bankruptcy, or assignment under RCW 19.72.070.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-015, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-015, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-025 How does a contractor register, renew, reregister or reinstate its registration?** (1) A contractor may register/renew/reregister/reinstate if it:

(a) Completes an application for contractor registration and submits it to the department as required by RCW 18.27.-030;

(b) Satisfies one of the following:

(i) Obtains a continuous surety bond in the total amount specified in WAC 296-200A-030 and submits the original bond with bond number to the department (see RCW 18.27.-040); or

(ii) Assigns, to the department, a security deposit in the form of a savings account held in a Washington state bank as specified in WAC 296-200A-030;

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(c) Obtains public liability and property damage insurance and submits the original insurance certificate with policy number to the department (see RCW 18.27.050); and

(d) Pays the issuance/renewal/reregistration/reinstatement fee shown in WAC 296-200A-900.

(2) A contractor may renew its registration if it submits, to the department, a completed contractor registration renewal notice and the material required in subsection (1)(b) and (c) of this section and pays the renewal fee shown in WAC 296-200A-900. No more than forty-five days before the contractor's registration expires, the department must send a renewal notice to the contractor's last recorded address. It is the responsibility of the contractor to notify the department **in writing** of a change in address.

(3) The contractor must:

(a) Submit all required documents to the department in a manner approved by the department as set forth in subsections (3)(b), (c), (d), and (4) of this section;

(b) Include, on each document, the name exactly as it appears on the contractor registration application or renewal notice;

(c) Include, if renewing a registration, the contractor's registration number on each of the documents; and

(d) Include a copy of the certificate or document (when required) by the secretary of state for the contractor to do business in the state of Washington.

(4) The department will not register, renew, or reinstate the registration of a contractor if:

(a) Any of the required documents are missing;

(b) The documents do not have the proper name of the contractor;

(c) In the case of a renewal, the documents do not include the registration number; or

(d) The applicant or person pursuant to RCW 18.27.030 has an unsatisfied final judgment based on work which is subject to chapter 18.27 RCW and this chapter.

(5) The contractor may request, in a letter filed with the application or renewal materials, that the registration period end on a particular day. However, the registration period cannot exceed two years.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-025, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-025, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-030 How much are the surety bond or savings account amounts?** (1) The continuous surety bond or savings account amounts for applicants of contractors with five or fewer final judgments involving a residential single-family dwelling on two or more different structures in the previous five years are as follows:

(a) Twelve thousand dollars for general contractors.

(b) Six thousand dollars for specialty contractors.

(2) The surety bond or savings account amounts for applicants of contractors with six or more final judgments involving a residential single-family dwelling on two or more different structures in the previous five years will be based upon (a) and (b) of this subsection. (a) and (b) of this subsection do not apply to final judgments rendered before July 22, 2001.

(a) General contractors.

Number of Final Judgments	Bond or Savings Account Amount per Calendar Year
6	\$18,000.00
7	\$24,000.00
8	\$30,000.00
9 or more	\$36,000.00

(b) Specialty contractors.

Number of Final Judgments	Bond or Savings Account Amount per Calendar Year
6	\$ 8,000.00
7	\$12,000.00
8	\$16,000.00
9 or more	\$18,000.00

(3) At the time of reregistration, renewal or reinstatement the department shall only consider final judgments from the previous five years which will be used to determine the bond or savings account amount according to subsection (2)(a) and (b) of this section. Final judgments rendered before July 22, 2001, will not be considered toward the required bond or savings account amount.

(4) For purposes of this section, final judgment does not include infractions.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-030, filed 9/30/03, effective 11/17/03.]

**WAC 296-200A-035 How long is a contractor's registration period?** A registration period is for two years per RCW 18.27.060(1).

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-035, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-035, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-040 What can cause the suspension of a contractor's registration?** (1) A contractor's registration will be suspended if the following impairments, cancellations, noncompliance, or errors occur:

(a) A surety bond or other security has an unsatisfied final judgment against it or becomes otherwise impaired.

(b) A surety bond is canceled.

(c) An insurance policy is expired, canceled, revoked or the insurer is withdrawn from the insurance policy.

(d) The contractor has an unsatisfied final judgment against it under chapter 18.27 RCW and this chapter.

(e) The department has notice that the contractor is a sole proprietor or a principal or officer of a registered contractor that has an unsatisfied final judgment against it for work within the scope of chapter 18.27 RCW and this chapter.

(f) The department is notified that the contractor has been certified by the department of social and health services as a person who is not in compliance with a support order as provided in RCW 74.20A.320.

(g) The department finds that the contractor has provided false information or has otherwise been registered in error.

(h) The contractor fails to comply with a penalty payment plan agreement.

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(i) The contractor has been certified by a leading agency and reported to the department for nonpayment or default on a federally or state-guaranteed educational loan or service conditional scholarship.

(j) The contractor does not maintain a valid unified business identifier number, if required by the department of revenue.

(2) The contractor's registration will be automatically suspended on the effective date of the impairment or cancellation. The department must mail a notice of the suspension to the contractor's address on the certificate of registration by certified mail **and** first class mail within two days after suspension.

(3) A contractor must not advertise, offer to do work, submit a bid, or perform any work as a contractor while its registration is suspended. To continue to operate as a contractor while its registration is suspended is a violation of chapter 18.27 RCW and subject to infractions.

(4) The department shall not deny an application or suspend a registration because of an unsatisfied final judgment if the applicant's or registrant's unsatisfied final judgment was determined by the director to be the result of the fraud or negligence of another party.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-040, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-040, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-050 What requirements must be met if a contractor changes its business structure, name or address?** (1) If a contractor changes its business structure (for example, from a partnership to a corporation or if the partners in a partnership change), the contractor must:

(a) Apply for a new registration as required in WAC 296-200A-025; and

(b) Pay the registration fee shown in WAC 296-200A-900.

(2) Failure to reregister after a change in business structure may invalidate the contractor's registration. See RCW 18.27.040.

(3) If a registered contractor changes its name, it must:

(a) Notify the department, in writing, of the change; and

(b) Pay the registration fee shown in WAC 296-200A-900; and

(c) Submit to the department a name change rider **or** a new bond in the new name and a certificate of insurance in the new name.

(4) If a registered contractor changes its address, it must notify the department in writing.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-050, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-060 What procedures must be followed when surety bonds and/or insurance policies are canceled?** (1) Insurance and bonding companies must send cancellation notices to the department.

(2) Cancellation notices must contain the following information:

(a) The name of the contractor exactly as it appears in the contractor's registration file;

(b) The contractor's registration number;

(2007 Ed.)

- (c) The contractor's business address;
- (d) The names of the owners, partners, or officers of the contractor;
- (e) The bond or insurance policy number; and
- (f) The effective date of the bond or insurance policy.

(3) The cancellation of a surety bond or insurance policy shall be considered effective immediately after the department receives a cancellation notice unless a later specific date is provided.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-060, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-060, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-065 What procedures must be followed when surety bonds and/or other securities approved by the department become impaired?** (1) Once the department has been notified that the surety bond or other securities approved by the department has been impaired by a final judgment or reduced by payment to an amount less than is required by WAC 296-200A-030, the contractor's registration will automatically be suspended and the department will send a letter to the contractor by certified mail.

(2) Once the unsatisfied final judgment has been satisfied, the contractor may reapply according to the requirements of this chapter.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-065, filed 9/30/03, effective 11/17/03.]

**WAC 296-200A-070 When will the department release a security deposit?** (1) The department will release a security deposit two years after the contractor's last registration has expired **unless** there is an unsatisfied final judgment or on-going claim against the contractor.

(2) The department will release a security deposit in less than two years after the contractor's last registration has expired if the contractor provides a surety bond covering **both the previous and current registration periods.**

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-070, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-070, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-080 How is a suit filed against a contractor?** (1) A civil suit against a contractor must be filed in the superior court of the county in which the work was done or of any county in which jurisdiction of the contractor may be had. Unless the suit is filed in a superior court, the department will not be able to direct payment on an unsatisfied final judgment against a secured contractor.

(2) Notice that a suit has been filed (a summons and complaint) against a contractor, the contractor's bond, and/or the contractor's deposit must be exclusively delivered to the department by registered or certified mail to: P.O. Box 44450, Olympia, Washington 98504-4450 or by any delivery requiring notice of receipt to: 7273 Linderson Way S.W., Tumwater, WA 98501. The notice must be addressed to the department and must include three copies of the summons and complaint filed against the contractor, the contractor's

bond and/or the contractor's deposit. The person filing the suit must pay a twenty-dollar service fee to the department.

(3) The summons and complaint against a contractor must include the following information:

- (a) The name of the contractor exactly as it appears in the contractor's registration file;
- (b) The contractor's business address;
- (c) The names of the owners, partners or officers of the contractor if known; and
- (d) The contractor's registration number.

(4) If the suit joins a bonding company, the summons and complaint should also include:

- (a) The name of the bonding company that issued the contractor's bond;
- (b) The bond number; and
- (c) The effective date of the bond.

(5) If the suit is against a contractor using an assigned account in lieu of a bond, the complaint must also include:

- (a) The name of the institution where the assigned account is held;
- (b) The account number; and
- (c) The date the assigned account was opened.

(6) Service is not considered complete until the department receives the documents in Tumwater with the twenty-dollar fee and three copies of the summons and complaint.

(7) Within two days of receiving a summons and complaint, the department must transmit a copy of the summons and complaint to the registrant at the address listed on the registrant's application or at their last known address provided to the department and to the registrant's surety.

(8) The department will return a summons and complaint without it being served, if the department cannot readily identify either the contractor or bonding company being sued, if the action did not arise under chapter 18.27 RCW, or if the fee and three copies of the summons and complaint are not received.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-080, filed 9/30/03, effective 11/17/03. Statutory Authority: RCW 43.22.350, 43.22.434, 43.22.480, 43.22.500, 18.27.040, 18.27.070, 18.27.075, 70.87.030, 19.28.041, 19.28.051, 19.28.101, 19.28.121, 19.28.161, 19.28.201, 19.28.211, 19.28.341, 2001 c 7, 2002 c 249, and chapters 19.28, 43.22, 18.27, and 70.87 RCW. 02-12-022, § 296-200A-080, filed 5/28/02, effective 6/28/02. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-080, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-090 How are judgments against contractors paid?** (1) **The department can only release or order release of payment for a superior court final judgment.** The department cannot release or order the release of payment to a district court or to satisfy other types of judgments.

(2) Payment of a final judgment by bond. If a contractor is bonded, the department can neither pay a final court judgment against a contractor nor force the contractor or its bonding company to pay. Only the claimant can pursue payment from the contractor or its bonding company.

(3) Payment of a final judgment by assignment of account.

(a) If a contractor's security is held by the department it must be used to pay a superior court final judgment against a secured contractor.

The department must pay a superior court final judgment against a secured contractor if the claimant supplies the department with one certified copy of the unpaid final court judgment. The certified copy must be delivered by registered or certified mail within one year of the date the final judgment was officially entered into the court record.

(b) Assignment of account payments under subsection (2) of this section will be paid out in the order the final judgment is received by the department.

(c) For the department to pay a superior court final judgment, the claimant must include the following information with the copy of the judgment:

- (i) The name of the contractor exactly as it appears on the contractor's registration file;
- (ii) The contractor's business address;
- (iii) The names of the owners, partners, or officers of the contractor;
- (iv) The contractor's registration number; and
- (v) The exact amount of the judgment, including court costs, attorneys' fees and interest.

If the department does not receive enough information to pay the judgment, it will inform the claimant.

The department shall have no liability for payment in excess of the amount of the secured account.

(4) Payment of a final judgment by the contractor. The contractor may pay a superior court final judgment in lieu of the department releasing or ordering the release of a bond or the assignment of account funds to satisfy the final judgment. The contractor must provide the department with a "full satisfaction of judgment" from the superior court that the final judgment has been satisfied.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-090, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-090, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-110 Is a city, town, or county required to verify a contractor registration number?** Before issuing a building permit, a city, county or town must verify the registration of the general or specialty contractor applying for the permit.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-110, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-111 How does a city, town, or county verify a contractor's registration?** (1) A city, town, or county may verify an original contractor registration by receiving and duplicating a current contractor registration card, by checking the department's contractor registration internet web site, checking the computer disk (CD) circulated by the department, or by calling the department to confirm that the contractor is registered.

(2) The contractor's registration is valid if the contractor provides a notarized copy of the original contractor registration card or a facsimile verification from the department.

**Note:** Although the contractor registration card states that the contractor has an active status, the contractor may have since been suspended.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-111, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-111, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-112 Who is liable when a city, town, or county fails to verify a contractor's registration?** The city, county, or town that issues a building permit without verifying the contractor's registration may be liable for a maximum penalty amount of ten thousand dollars. See RCW 18.27.110(1).

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-112, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-112, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-300 What violations of chapter 18.27 RCW can result in the issuance of a notice of infraction?** (1) Under RCW 18.27.100, the department can issue a notice of infraction to a contractor and assess a penalty up to ten thousand dollars for:

- (a) Using an unregistered name while advertising as a contractor;
- (b) Using an unregistered name and address in advertising, correspondence, signs, documents, etc.;
- (c) Using a false or expired registration number in advertisements where a contractor's registration number is required;
- (d) Using the bond and insurance requirements of chapter 18.27 RCW to advertise as a bonded and insured contractor;
- (e) Using a false registration number to either solicit business or pose as a contractor;
- (f) Failing to include the contractor's current registration number in all advertising that shows the contractor's name or address. This registration number may be omitted in an alphabetized listing of registered contractors stating only the name, address, and telephone number. See RCW 18.27.100 (3).

(2) For violations of chapter 18.27 RCW, the department may issue penalties for violations and notices of infractions containing an order of correction to a person holding a registration, an applicant for registration, or a person acting in the capacity of a contractor, who is not otherwise exempted from chapter 18.27 RCW, that has violated chapter 18.27 RCW or this chapter. Such order shall require the violator to cease the unlawful advertising.

(3) The department may issue a notice of infraction to a contractor for failing to provide a residential or commercial customer with a proper disclosure statement before beginning a repair, alterations or construction project. See RCW 18.27.114(1) for both the project dollar cost limits affecting this requirement and a sample disclosure statement.

This requirement does not apply to either contracts authorized under chapter 39.04 RCW or to contractors contracting with other contractors.

(4) Under RCW 18.27.200, the department must issue a notice of infraction to a contractor for:

- (a) Advertising, offering to work, submitting a bid, or performing any contracting work without being registered or when the contractor's registration is suspended or revoked; or
- (b) Transferring a valid contractor registration to an unregistered contractor; or
- (c) Allowing an unregistered contractor to work under a registration issued to another contractor.

Each day that a contractor works without being registered, works while the registration is suspended or revoked, or works under a registration issued to another contractor is a separate infraction. A cited contractor who continues to work while unregistered, or while their registration is suspended or revoked, or under a registration issued to another contractor is guilty of a separate misdemeanor for each day worked.

Each worksite at which a contractor works without being registered, works while the registration is suspended or revoked, or works under a registration issued to another contractor is a separate infraction. A cited contractor who continues to work while unregistered, or while their registration is suspended or revoked, or under a registration issued to another contractor is guilty of a separate misdemeanor for each worksite on which a violation occurs.

(5) See WAC 296-200A-400 for the specific monetary penalties associated with each of the violations discussed in this section.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-300, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-300, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-305 How does the department notify registered contractors regarding any unregistered subcontractors they may employ?** (1) Unless a general contractor or its representative has been given written notification by the department that a subcontractor they have employed, who was registered when employed, has subsequently become unregistered, it is not unlawful for the general contractor to employ that subcontractor. (See RCW 18.27.020(3).)

(2) To comply with RCW 18.27.020(3), the department, when feasible, will issue a written "notice of unregistered subcontractors" to a general contractor or its representative.

(3) A "notice of unregistered subcontractor" issued under this section must be personally served on the general contractor named in the notice by the department's compliance inspectors or must be served by certified mail directed to the general contractor named in the notice.

(4) If the general contractor named in the notice is a firm or corporation, the notice may be personally served on any employee of the firm or corporation. If the notice is personally served upon an employee and the department is able to obtain the general contractor's address, the department must send a copy of the notice by certified mail to the general contractor within four days of service.

(5) A "notice of unregistered subcontractor" is not a notice of infraction.

(6) If, after receiving the "notice of unregistered subcontractor," the general contractor continues to employ the subcontractor in question, it will be liable for an infraction under RCW 18.27.200.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-305, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-305, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-310 What information must be included in a notice of infraction?** When a contractor violates chapter 18.27 RCW, the department may issue a notice of infraction which contains the following:

(2007 Ed.)

(1) Notification that an infraction has been committed and shall be final unless contested;

(2) Notification that an infraction is a noncriminal offense and is not punishable by imprisonment;

(3) The specific violation(s) leading to the issuance of the infraction;

(4) The amount of penalty owed if the infraction is established;

(5) Notification of a right to a hearing (chapter 34.05 RCW) if requested within twenty days of service of the infraction;

(6) A reminder that the burden of proof in a hearing rests upon the state;

(7) Notification of a right to subpoena witnesses, including the inspector who issued the infraction;

(8) A reminder that a contractor is legally required to sign a notice of infraction and, by doing so, promises to respond to it;

(9) A reminder that a refusal to sign a notice of infraction is a misdemeanor and may be punishable by fine or imprisonment; and

(10) A reminder that a failure to respond to a notice of infraction is a misdemeanor and may be punishable by a fine or imprisonment.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-310, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-310, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-320 How can a notice of infraction be served?** (1) A notice of infraction is served when the notice of infraction is issued personally to the contractor named in the notice by the compliance inspector issuing it or when the notice of infraction is sent by certified mail to the contractor.

(2) Any employee of a contractor can be served a notice of infraction at a job site. When the notice is signed by the employee, it is binding upon the contractor. To avoid confusion, the department must have the employee sign the "name of the contractor, by name of the employee." The signature will appear as:

Jane Doe Construction Co.

(by) Richard Roe, Employee.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-320, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-320, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-330 How are notices of infraction issued?** (1) A notice of infraction may be issued personally to the contractor named in the notice by the compliance inspector issuing it or the notice may be sent to the contractor by certified mail.

(2) When the department's compliance inspector serves a notice of infraction upon a contractor's employee, the department shall within four days send a copy of the notice to the contractor by certified mail if the department is able to obtain the contractor's address. To ensure that the contractor receives this notice, the department will mail a second copy of the infraction by first class mail.

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(3) If the department does not know the contractor's name and address, it does not need to mail a copy of the infraction to the contractor, however, the notice remains in force.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-330, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-330, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-340 How does a contractor appeal a notice of infraction?** The contractor must file the notice of appeal with the department within twenty days after the earlier of service of the infraction on-site or service of the infraction mailed to the contractor. These time frames apply to the issuance of the infraction for all violations of chapter 18.27 RCW.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-340, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-340, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-350 Who presides over an appeal hearing and where is it held?** An administrative law judge from the office of administrative hearings will preside over the hearing and give a decision. The hearing shall be conducted in the county where the infraction occurred. However, both the contractor and the department have a right to ask the administrative law judge to change the hearing's location.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-350, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-360 Who may represent the contractor and the department at the appeal hearing?** (1) Contractors may be represented by themselves or be represented by an attorney at law qualified to practice in the state of Washington; or

(2) The department shall be represented by the office of the attorney general.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-360, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-360, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-370 How is the appeal hearing conducted?** The hearing process shall be conducted according to chapter 34.05 RCW, Administrative Procedure Act and chapter 10-08 WAC. All appeals of the administrative law judge's decision shall be to the superior court according to chapter 34.05 RCW.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-370, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-370, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-380 What evidence is admissible in an appeal hearing?** The admission of evidence is subject to chapter 34.05 RCW, Administrative Procedure Act.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-380, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-380, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-390 What does the department do with the appeal notices that they receive?** (1) Appeal notices that are received timely are first reviewed by the department for purposes of reconsideration.

(2) Appeal notices that are not received timely will be returned to the appellant with appeal rights stated.

(3) Appeal notices that are received timely and are not reconsidered according to subsection (1) of this section are recorded and forwarded to the office of the attorney general then to the office of administrative hearings.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-390, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-390, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-400 What monetary penalties will be assessed for an infraction issued for violations of RCW 18.27.100, 18.27.110, 18.27.114 or 18.27.200?** (1) Each day that a violation occurs will be a separate offense.

(2) Once a violation of chapter 18.27 RCW or this chapter becomes a final judgment, any additional violation within three years becomes a "second" or "additional" offense subject to an increased penalty as set forth in the tables that follow.

(3) Second or additional offenses subject to increased penalties also include individuals or entities.

(4) A person, firm, corporation, or other entity who violates a provision of chapter 18.27 RCW and this chapter is liable for a civil penalty based upon the following schedule.

(a)(i) Monetary penalties that may be assessed for a violation of RCW 18.27.100 (1), (2), (3), and (4) are:

Monetary Penalties	Dollar Amount
First Final Violation	\$ 250.00*
Second Final Violation	\$ 500.00
Third Final Violation	\$ 1,000.00
Fourth Final Violation	\$ 2,000.00
Fifth Final Violation	\$ 4,000.00
Sixth Final Violation	\$ 8,000.00
Each Additional Final Violation	\$ 10,000.00

\* Minimum penalty per violation. Once a violation of RCW 18.27.100 (1), (2), (3), and (4) becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the table above.

(ii) Monetary penalties that may be assessed for a violation of RCW 18.27.100(5) are:

Monetary Penalties	Dollar Amount
First Final Violation	\$ 1,000.00*
Second Final Violation	\$ 2,000.00
Third Final Violation	\$ 4,000.00
Fourth Final Violation	\$ 8,000.00
Each Additional Final Violation	\$10,000.00

\* Minimum penalty per violation. Once a violation of RCW 18.27.100(5) becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the table above.

(iii) Monetary penalties that may be assessed for a violation of RCW 18.27.100(6) are:

Monetary Penalties	Dollar Amount
First Final Violation	\$ 1,000.00*
Second Final Violation	\$ 2,000.00

<b>Monetary Penalties</b>	<b>Dollar Amount</b>
Third Final Violation	\$ 4,000.00
Each Additional Final Violation	\$ 5,000.00

\* Minimum penalty per violation. Once a violation of RCW 18.27.100(6) becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the table above.

(b) Monetary penalties that may be assessed for a violation of RCW 18.27.110 are:

<b>Monetary Penalties</b>	<b>Dollar Amount</b>
First Final Violation	\$ 250.00*
Second Final Violation	\$ 500.00
Third Final Violation	\$ 1,000.00
Fourth Final Violation	\$ 2,000.00
Fifth Final Violation	\$ 4,000.00
Sixth Final Violation	\$ 8,000.00
Each Additional Final Violation	\$10,000.00

\* Minimum penalty per violation. Once a violation of RCW 18.27.110 becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the table above.

(c) Monetary penalties that may be assessed for a violation of RCW 18.27.114 are:

<b>Monetary Penalties</b>	<b>Dollar Amount</b>
First Final Violation	\$ 500.00*
Second Final Violation	\$ 1,000.00
Third Final Violation	\$ 2,000.00
Fourth Final Violation	\$ 4,000.00
Each Additional Final Violation	\$ 5,000.00

\* Minimum penalty per violation. Once a violation of RCW 18.27.114 becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the table above.

(d) Monetary penalties that may be assessed for a violation of RCW 18.27.200 according to RCW 18.27.340 (1) and (3) are:

(i)

<b>RCW 18.27.340(1) Monetary Penalties</b>	<b>Dollar Amount</b>
First Final Violation	\$ 500.00*
Second Final Violation	\$ 1,000.00
Third Final Violation	\$ 2,000.00
Fourth Final Violation	\$ 4,000.00
Each Additional Final Violation	\$ 5,000.00

\* Minimum penalty per violation. Once a violation of RCW 18.27.340(1) becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the table above.

(ii)

<b>RCW 18.27.340(3) Monetary Penalties</b>	<b>Dollar Amount</b>
First Final Violation	\$ 1,000.00*
Second Final Violation	\$ 2,000.00
Third Final Violation	\$ 4,000.00
Each Additional Final Violation	\$ 5,000.00

\* Minimum penalty per violation. Once a violation of RCW 18.27.340(3) becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the above table. However, if the unregistered contractor becomes registered within ten days of receiving the notice of infraction and the notice is the contractor's first offense, the director may reduce the penalty. In no case can the director reduce the penalty below five hundred dollars.

(4) For violations of RCW 18.27.200, the director may waive a penalty collection from a contractor in exchange for a payment of restitution to a damaged consumer in an amount at least equal to the assessed penalty. Prior to the infraction becoming final, the contractor must provide to the department a notarized release from the damaged consumer stating that he or she paid the damaged consumer in an amount at least equal to the assessed penalty.

(5)(a) The department shall deny an application for registration if:

(i) The applicant has been previously performing work subject to this chapter as a sole proprietor, partnership, corporation, or other entity and the department has notice that the applicant has an unsatisfied final judgment against him or her in an action based on this chapter or the applicant owes the department money for penalties assessed or fees due under this chapter as a result of a final judgment;

(ii) The applicant was a principal or officer of a partnership, corporation, or other entity that either has an unsatisfied final judgment against it in an action that was incurred for work performed subject to this chapter or owes the department money for penalties assessed or fees due under this chapter as a result of a final judgment; or

(iii) The applicant does not have a valid unified business identifier number, if required by the department of revenue.

(b) The department shall suspend an active registration if the department has notice that the registrant is a sole proprietor or a principal or officer of a registered contractor that has an unsatisfied final judgment against it for work within the scope of this chapter.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-400, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-400, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-405 When must a contractor pay assessed monetary penalties?** (1) If a contractor named in a notice of infraction does not choose to appeal the notice, then the contractor must pay the department the amount of the penalty prescribed for the infraction.

(2) After an administrative law judge decides that an infraction has been committed, a contractor who does not appeal the decision to a superior court, has thirty days to pay any outstanding monetary penalties. Failure to do so is a misdemeanor and may be prosecuted in the county where the infraction occurred.

(3) A contractor who has exhausted all appeal opportunities and fails to pay an assessed monetary penalty within thirty days after exhausting those opportunities shall be guilty of a misdemeanor and may be prosecuted in the county where the infraction occurred.

[Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125, 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-405, filed 9/30/03, effective 11/17/03. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-405, filed 12/2/97, effective 1/5/98.]

**WAC 296-200A-900 What fees does the department charge contractors for issuance, renewal, reregistration, and reinstatement of certificates of registration?** The department charges the following fees:

(1) \$109.70 for each issuance, renewal or reregistration of a certificate of registration for contractors. This registration is valid for two years from date of issuance, renewal or reregistration or until it is suspended or revoked.

(2) \$51.90 for the reinstatement of a certificate of registration.

(3) \$12.20 for providing a duplicate certificate of registration.

(4) \$24.80 for each requested certified letter prepared by the department.

(5) \$162.00 for the construction and electrical contractor listing publication on CD ROM per year, prorated according to the number of issues left in the subscription year, which runs from November 1 through October 31. Each issue costs \$13.50.

(6) \$2.00 per copy for documents copied from a contractor's file. The maximum copy charge for copies from one contractor's file will be \$27.20.

(7) \$20.00 is required to cover the costs for the service of process in an action against a contractor, the contractor's bond, or the deposit under RCW 18.27.040.

(8) \$25.00 is required to cover the costs for the service of processing refunds.

[Statutory Authority: Chapters 18.27, 43.22, and 70.87 RCW. 05-12-032, § 296-200A-900, filed 5/24/05, effective 6/30/05. Statutory Authority: Chapters 18.27 and 43.22 RCW. 04-12-048, § 296-200A-900, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.27.040, 18.27.070, 18.27.075, 18.27.125 and 2001 c 159, and chapter 18.27 RCW. 03-20-097, § 296-200A-900, filed 9/30/03, effective 11/17/03. Statutory Authority: RCW 43.22.350, 43.22.434, 43.22.480, 43.22.500, 18.27.040, 18.27.070, 18.27.075, 70.87.030, 19.28.041, 19.28.051, 19.28.101, 19.28.121, 19.28.161, 19.28.201, 19.28.211, 19.28.341, 2001 c 7, 2002 c 249, and chapters 19.28, 43.22, 18.27, and 70.87 RCW. 02-12-022, § 296-200A-900, filed 5/28/02, effective 6/28/02. Statutory Authority: RCW 43.22.350, 43.22.434, 43.22.480, 43.22.500, 18.27.070, 18.27.075, 70.87.030, 19.28.041, 19.28.051, 19.28.101, 19.28.121, 19.28.161, 19.28.201, 19.28.211, 19.28.341, 2001 c 159, and chapters 43.22, 19.28, 18.27, and 70.87 RCW. 01-12-035, § 296-200A-900, filed 5/29/01, effective 6/29/01. Statutory Authority: Chapters 43.22, 18.27, 70.87 and 19.28 RCW. 99-12-080, § 296-200A-900, filed 5/28/99, effective 6/28/99. Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW. 98-12-041, § 296-200A-900, filed 5/29/98, effective 6/30/98. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-900, filed 12/2/97, effective 1/5/98.]

### Chapter 296-301 WAC

#### SAFETY STANDARDS FOR THE TEXTILE INDUSTRY

##### WAC

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**WAC 296-301-010 Textiles—Application requirements.** (1) Application. The requirements of this chapter for textile safety apply to the design, installation, processes, operation, and maintenance of textile machinery, equipment, and other plant facilities in all plants engaged in the manufacture and processing of textiles, except those processes used exclusively in the manufacture of synthetic fibers.

(2) These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(3) The provisions of this chapter shall prevail in the event of conflict with or duplication of, provisions contained in chapter 296-24 WAC, the general safety and health standards, chapter 296-62 WAC, the general occupational health standards, and chapter 296-800 WAC, the safety and health core rule book.

(4) WAC 296-24-012 and 296-800-360 shall apply where applicable to this industry.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-301-010, filed 5/9/01, effective 9/1/01; Order 74-19, § 296-301-010, filed 5/6/74.]

**WAC 296-301-015 Definitions applicable to this chapter.** (1) "Belt shifter" means a device for mechanically shifting a belt from one pulley to another.

(2) "Belt shifter lock" means a device for positively locking the belt shifter in position while the machine is stopped and the belt is idling on the loose pulleys.

(3) "Calendar" means a machine consisting of a set of heavy rollers mounted on vertical side frames and arranged to pass cloth between them. Calendars may have two to ten rollers, or bowls, some of which can be heated.

(4) "Embossing calender" means a calender with two or more rolls, one of which is engraved for producing figured effects of various kinds on a fabric.

(5) "Cans (drying)" means hollow cylindrical drums mounted in a frame so they can rotate. They are heated with

steam and are used to dry fabrics or yarn as it passes around the perimeter of the can.

(6) "Carbonizing" means the removing of vegetable matter such as burns, straws, etc., from wool by treatment with acid, followed by heat. The undesired matter is reduced to a carbon-like form which may be removed by dusting or shaking.

(7) "Card" machine means a machine consisting of cylinders of various sizes—and in certain cases flats—covered with card clothing and set in relation to each other so that fibers in staple form may be separated into individual relationship. The speed of the cylinders and their direction of rotation varies. The finished product is delivered as a sliver. Cards of different types are: The revolving flat card, the roller-and-clearer card, etc.

(8) "Card clothing" means the material with which many of the surfaces of a card are covered; e.g., the cylinder, doffer, etc. It consists of a thick foundation material, usually made of textile fabrics, through which are pressed many fine, closely spaced, specially bent wires.

(9) "Comber" means a machine for combing fibers of cotton, wool, etc. The essential parts are a device for feeding forward a fringe of fibers at regular intervals and an arrangement of combs or pins which, at the right time, pass through the fringe. All tangled fibers, short fibers, and neps are removed and the long fibers are laid parallel.

(10) "Combing machinery" means a general classification, including combers, sliver lap machines, ribbon lap machines, and gill boxes, but excluding cards.

(11) "Cutter (rotary staple)" means a machine consisting of one or more rotary blades used for the purpose of cutting textile fibers into staple lengths.

(12) "Exposed to contact" means that the location of an object, material, nip point, or point of operation is such that a person is liable to come in contact with it in his normal course of employment.

(13) "Garnett machine" means any of a number of types of machines for opening hard twisted waste of wool, cotton, silk, etc. Essentially, such machines consist of a lickerin; one or more cylinders, each having a complement worker and stripper rolls; and a fancy roll and doffer. The action of such machines is somewhat like that of a wool card, but it is much more severe in that the various rolls are covered with garnett wire instead of card clothing.

(14) "Gill box" means a machine used in the worsted system of manufacturing yarns. Its function is to arrange the fibers in parallel order. Essentially, it consists of a pair of feed rolls and a series of followers where the followers move at a faster surface speed and perform a combing action.

(15) "Interlock" means a device that operates to prevent the operation of machine while the cover or door of the machine is open or unlocked, and which will also hold the cover or door closed and locked while the machine is in motion.

(16) "Jig (dye)" means a machine for dyeing piece goods. The cloth, at full width, passes from a roller through the dye liquor in an open vat and is then wound on another roller. The operation is repeated until the desired shade is obtained.

(17) "Kier" means a large metal vat, usually a pressure type, in which fabrics may be boiled out, bleached, etc.

(18) "Lapper (ribbon)" means a machine used to prepare laps for feeding a cotton comb; its purpose is to provide a uniform lap in which the fibers have been straightened as much as possible.

(19) "Lapper (sliver)" means a machine in which a number of parallel card slivers are drafted slightly, laid side by side in a compact sheet, and wound into a cylindrical package.

(20) "Loom" means a machine for effecting the interlacing of two series of yarns crossing one another at right angles. The warp yarns are wound on a warp beam and pass through heddles and reed. The filling is shot across in a shuttle and settled in place by reed and lay, and the fabric is wound on a cloth beam.

(21) "Starch mangle" means a mangle that is used specifically for starching cotton goods. It commonly consists of two large rolls and a shallow open vat with several immersion rolls. The vat contains the starch solution.

(22) "Water mangle" means a calender having two or more rolls used for squeezing water from fabrics before drying. Water mangles also may be used in other ways during the finishing of various fabrics.

(23) "Mule" means a type of spinning frame having a head stock and a carriage as its two main sections. The head stock is stationary. The carriage is movable and it carries the spindles which draft and spin the roving into the yarn. The carriage extends over the whole width of the machine and moves slowly toward and away from the head stock during the spinning operation.

(24) "Nip" means the point of contact between two in-running rolls.

(25) "Openers and pickers" means a general classification which includes breaker pickers, intermediate pickers, finisher pickers, single process pickers, multiple process pickers, willow machines, card and picker waste cleaners, thread extractors, shredding machines, roving waste openers, shoddy pickers, bale breakers, feeders, vertical openers, lattice cleaners, horizontal cleaners, and any similar machinery equipped with either cylinders, screen section, calender section, rolls, or beaters used for the preparation of stock for further processing.

(26) "Paddler" means equipment consisting of a trough for a solution and two or more squeeze rolls between which cloth passes after being passed through a mordant or dye bath.

(27) "Point of operation" means that part of the machine where the work of cutting, shearing, squeezing, drawing, or manipulating the stock in any other way is done.

(28) "Roller printing machine" means a machine consisting of a large central cylinder, or pressure bowl, around the lower part of the perimeter of which is placed a series of engraved color rollers (each having a color trough), a finisher roller, doctor blades, etc. The machine is used for printing fabrics.

(29) "Continuous bleaching ranges" means ranges of several types and may be made for cloth in rope or open-width form. The goods, after wetting out, pass through a squeeze roll into a saturator containing a solution of caustic soda and then to an enclosed J-box. A V-shaped arrangement is attached to the front part of the J-box for uniform and rapid saturation of the cloth with steam before it is packed down in

the J-box. The cloth, in a single strand rope form, passes over a guide roll down the first arm of the "V" and up the second. Steam is injected into the "V" at the upper end of the second arm so that the cloth is rapidly saturated with steam at this point. The J-box capacity is such that cloth will remain hot for a sufficient time to complete the scouring action. It then passes a series of washers with a squeeze roll in between. The cloth then passes through a second set of saturator, J-box, and washer, where it is treated with the peroxide solution. By slight modification of the form of the unit, the same process can be applied to open-width cloth.

(30) "Mercerizing range" generally means a 3-bowl mangle, a tenter frame, and a number of boxes for washing and scouring. The whole setup is in a straight line and all parts operate continuously. The combination is used to saturate the cloth with sodium hydroxide, stretch it while saturated, and washing out most of the caustic before releasing tension.

(31) "Sanforizing machine" means a machine consisting of a large steam-heated cylinder, an endless, thick, woolen felt blanket which is in close contact with the cylinder for most of its perimeter, and an electrically heated shoe which presses the cloth against the blanket while the latter is in a stretched condition as it curves around feed-in roll.

(32) "Shearing machine" means a machine used in shearing cloth. Cutting action is provided by a number of steel blades spirally mounted on a roller. The roller rotates in close contact with a fixed ledger blade. There may be from one to six such rollers on a machine.

(33) "Singeing machine" means a machine used particularly with cotton, comprised of a heated roller, plate, or an open gas flame. The material is rapidly passed over the roller or the plate or through the open gas flame to remove fuzz or hairiness on yarn or cloth by burning.

(34) "Slasher" means a machine used for applying a size mixture to warp yarns. Essentially, it consists of a stand for holding section beams, a size box, one or more cylindrical dryers or an enclosed hot air dryer, and a beaming end for finding the yarn on the loom beams.

(35) "Industrial organic solvent" means any organic volatile liquid or compound, or any combination of these substances which are used to dissolve or suspend a nonvolatile or slightly volatile substance for industrial utilization. It shall also apply to such substances when used as detergents or cleansing agents. It shall not apply to petroleum products when such products are used as fuel.

(36) "Tenter frame" means a machine for drying cloth under tension. It essentially consists of a pair of endless traveling chains fitted with clips of fine pins and carried on tracks. The cloth is firmly held at the selvages by the two chains which diverge as they move forward so that the cloth is brought to the desired width.

(37) "Warper" means any machine for preparing and arranging the yarns intended for the warp of a fabric, specifically, a beam warper.

[Order 74-19, § 296-301-015, filed 5/6/74.]

**WAC 296-301-020 General safety requirements.** (1) Means of stopping machines. Every textile machine shall be provided with individual mechanical or electrical means for

stopping such machines. On machines driven by belts and shafting a locking-type shifter or an equivalent positive device shall be used. On operations where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.

(2) Handles. Stopping and starting handles shall be designed to the proper length to prevent the worker's hand or fingers from striking against any revolving part, gear guard, or any other part of the machine.

(3) Machine guarding. An employer must ensure that power transmission parts are guarded according to the requirements of WAC 296-24-205 through 296-24-20527.

(4) Housekeeping. Aisles and working spaces shall be kept in good order in accordance with requirements of WAC 296-24-735 through 296-24-73505 and WAC 296-800-220.

(5) Inspection and maintenance. All guards and other safety devices, including starting and stopping devices, shall be properly maintained.

(6) Lighting and illumination. Lighting and illumination shall conform to the safety and health core rule book, WAC 296-800-210.

(7) Identification of piping systems. Identification of piping systems shall conform to American National Standard A13.1-1956.

(8) Steam pipes. All pipes carrying steam or hot water for process or servicing machinery, when exposed to contact and located within seven feet of the floor or working platform shall be covered with a heat-insulating material, or guarded with equivalent protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 04-18-080, § 296-301-020, filed 8/31/04, effective 11/1/04; 04-14-028, § 296-301-020, filed 6/29/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-301-020, filed 5/9/01, effective 9/1/01; 99-17-094 and 99-22-093, § 296-301-020, filed 8/17/99 and 11/2/99, effective 1/1/00; 98-10-073, 98-24-120 and 99-12-091, § 296-301-020, filed 5/4/98, 12/2/98 and 6/1/99, effective 1/1/00; Order 74-19, § 296-301-020, filed 5/6/74.]

**WAC 296-301-025 Openers and pickers.** (1) Beater guards. When any opening or picker machinery is equipped with a beater, such beater shall be provided with metal covers which will prevent contact with the beater. Such covers shall be provided with an interlock which will prevent the cover from being raised while the machine is in motion and prevent the operation of the machine while the cover is open.

(2) Cleanout holes. Cleanout holes within reaching distance of the fan or picker beater shall have their covers securely fastened and they shall not be opened while the machine is in motion.

(3) Feed rolls. The feed rolls on all opening and picking machinery shall be covered with a guard designed to prevent the operator from reaching the nip while the machinery is in operation.

(4) Removal of foreign ferrous material. All textile opener lines shall be equipped with magnetic separators, tramp iron separators, or other means for the removal of foreign ferrous material.

[Order 74-19, § 296-301-025, filed 5/6/74.]

**WAC 296-301-030 Cotton cards.** (1) Enclosures. Cylinder and lickerins shall be equipped with guards and the doffers should be enclosed.

(2) Enclosure fastenings. The enclosures or covers shall be kept in place while the machine is in operation, except when stripping or grinding.

(3) Stripping rolls. On operations calling for flat strippings which are allowed to fall on the doffer cover, where such strippings are removed by hand, the doffer cover shall be kept closed and securely fastened to prevent the opening of the cover while the machine is in operation. When it becomes necessary to clean the cards while they are in motion, a long-handled brush or dust mop shall be used.

[Order 74-19, § 296-301-030, filed 5/6/74.]

**WAC 296-301-035 Garnett machines.** (1) Lickerin. Garnett lickerins shall be enclosed.

(2) Fancy rolls. Garnett fancy rolls shall be enclosed by covers. These shall be installed in a way that keeps worker rolls reasonably accessible for removal or adjustment.

(3) Underside of machine. The underside of the garnett shall be guarded by a screen mesh or other form of enclosure to prevent access while machine is running.

[Order 74-19, § 296-301-035, filed 5/6/74.]

**WAC 296-301-040 Spinning mules.** A substantial fender of metal or hardwood shall be installed in front of the carriage wheels, the fender to extend to within one-fourth inch of the rail.

[Order 74-19, § 296-301-040, filed 5/6/74.]

**WAC 296-301-045 Slashers—Scope and application.** All sections of this chapter which include WAC 296-301-045 in the section number apply to slashers.

[Order 74-19, § 296-301-045, filed 5/6/74.]

**WAC 296-301-04501 Cylinder dryers.** (1) Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

(2) Vacuum relief valves. Vacuum relief valves shall conform to the ASME Code for Pressure Vessels, section VIII, Unfired Pressure Vessels, 1968.

(3) Lever control. When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(4) Pushbutton control. Slashers operated by pushbutton control shall have stop and start buttons located at each end of the machine, and additional buttons located on both sides of the machine, at the size box and the delivery end. If calender rolls are used, additional buttons shall be provided at both sides of the machine at points near the nips, except when slashers are equipped with an enclosed dryer.

(5) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

(6) Cylinder enclosure. When enclosures or hoods are used over cylinder drying rolls, such enclosures or hoods shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the work-

room.

(7) Expansion chambers. Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam-control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

[Order 74-19, § 296-301-04501, filed 5/6/74.]

**WAC 296-301-04503 Enclosed hot air dryers.** (1) Lever control. When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(2) Push-button control. Slashers operated by push-button control shall have one start button at each end of the machine and stop buttons shall be located on both sides of the machines at intervals spaced not more than 6 feet on centers.

Note: Inching buttons should be installed.

(3) Dryer enclosure. The dryer enclosure shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the workroom.

(4) Nip guards. All nip guards shall comply with Table R-1.

**TABLE R-1**  
GUARD OPENINGS

Openings in the guard or between the guard and working surface shall not be greater than the following:

Distance of opening from nip point	Maximum width of opening
0 to 1 1/2	1/4
1 1/2 to 2 1/2	3/8
2 1/2 to 3 1/2	1/2
3 1/2 to 5 1/2	5/8
5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 8 1/2	1 1/4

The measurements in Table R-1 are all in inches.

(5) Expansion chambers. Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

[Order 74-19, § 296-301-04503, filed 5/6/74.]

**WAC 296-301-050 Warpings.** (1) Swiveled double-bar gates. Swiveled double-bar gates shall be installed on all warpings operating in excess of 450 yards per minute. These gates shall be so interlocked that the machine cannot be operated until the gate is in the "closed position," except for the purpose of inching or jogging.

(2) Closed position. "Closed position" shall mean that the top bar of the gate shall be at least 42 inches from the floor or working platform; and the lower bar shall be at least 21 inches from the floor or working platform; and the gate shall be located 15 inches from the vertical tangent to the beam head.

[Order 74-19, § 296-301-050, filed 5/6/74.]

**WAC 296-301-055 Drawing frames, slubbers, roving parts, cotton combers, ring spinning frames, twistors.** Gear housing covers on all installations of drawing frames, slubbers, roving frames, cotton combers, ring spinning frames, and twistors shall be equipped with interlocks.

[Order 74-19, § 296-301-055, filed 5/6/74.]

**WAC 296-301-060 Gill boxes.** (1) Pin guard. A guard shall be placed ahead of the feed end and shall be so designed that it will prevent the worker's fingers from being caught in the pins of the intersecting fallers.

(2) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-060, filed 5/6/74.]

**WAC 296-301-065 Heavy draw boxes, finishers, and speeders used in worsted drawing.** (1) Band pulley covers. Covers for band pulleys shall be closed when the machine is in motion.

(2) Benches or working platforms. Benches or working platforms approximately 10 inches in height and 8 inches in width should be installed along the entire running length of the machine for the worker to stand on while creeling the machine. Such benches or platforms shall be covered with an abrasive or nonslip material.

[Order 74-19, § 296-301-065, filed 5/6/74.]

**WAC 296-301-070 Silver and ribbon lappers (cotton).** Cover guard. An interlocking cover guard shall be installed over the large calender drums and the lap spool, designed to prevent the operator from coming in contact with the nip.

[Order 74-19, § 296-301-070, filed 5/6/74.]

**WAC 296-301-075 Looms.** (1) Shuttle guard. Each loom shall be equipped with a guard designed to minimize the danger of the shuttle flying out of the shed.

(2) Protection for loom fixer. Provisions shall be made so that every loom fixer can prevent the loom from being started while he is at work on the loom. This may be accomplished by means of a lock, the key to which is retained in the possession of the loom fixer, or by some other effective means to prevent starting the loom.

[Order 74-19, § 296-301-075, filed 5/6/74.]

**WAC 296-301-080 Shearing machines.** All revolving blades on shearing machines shall be guarded so that the opening between the cloth surface and the bottom of the guard will not exceed three-eighths inch.

[Order 74-19, § 296-301-080, filed 5/6/74.]

**WAC 296-301-085 Continuous bleach range (cotton and rayon).** (1) J-box protection. Each valve controlling the flow of steam, injurious gases, or liquids into a J-box shall be equipped with a chain, lock, and key, so that any worker who enters the J-box can lock the valve and retain the key in his possession. Any other method which will prevent steam, injurious gases, or liquids from entering the J-box while the worker is in it will comply with this provision.

[Title 296 WAC—p. 2266]

(2) Open-width bleaching. The nip of all in-running rolls on open-width bleaching machine rolls shall be protected with a guard to prevent the worker from being caught at the nip. The guard shall extend across the entire length of the nip.

[Order 74-19, § 296-301-085, filed 5/6/74.]

**WAC 296-301-090 Kiers.** (1) Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the ASME Code for Unfired Pressure Vessels, section VIII, Unfired Pressure Vessels, 1968.

(2) Kier valve protection. Each valve controlling the flow of steam, injurious gases, or liquids into a kier shall be equipped with a chain, lock, and key, so that any worker who enters the kier can lock the valve and retains the key. Any other method which will prevent steam, injurious gases, or liquids from entering the kier while the worker is in it will be acceptable.

[Order 74-19, § 296-301-090, filed 5/6/74.]

**WAC 296-301-095 Gray and white bins.** Guard rails conforming to WAC 296-24-750 through 296-24-75011, of the general safety and health standards, shall be provided where workers are required to plait by hand from the top of the bin so as to protect the worker from falling to a lower level.

[Order 74-19, § 296-301-095, filed 5/6/74.]

**WAC 296-301-100 Mercerizing range (piece goods).** (1) Stopping devices. A stopping device shall be provided at each end of the machine.

(2) Frame ends. A guard shall be installed at each end of the frame between the in-running chain and the clip opener, to prevent the worker's fingers from being caught.

(3) Mangle and washers. The nip at the in-running rolls shall conform to WAC 296-301-04503(4).

[Order 74-19, § 296-301-100, filed 5/6/74.]

**WAC 296-301-105 Tenter frames.** (1) Stopping devices. A stopping device shall be provided at each end of the machine.

(2) Frame ends. A guard shall be installed at each end of the frame at the in-running chain and clip opener.

(3) Oil cups. Oil cups shall be located to permit safe and easy access. They shall be of the extension type to permit oiling while machines are operating.

[Order 74-19, § 296-301-105, filed 5/6/74.]

**WAC 296-301-110 Dyeing jigs.** (1) Stopping devices. Each dye jig shall be equipped with individual mechanical or electrical means for stopping the machine.

(2) Roll arms. Roll arms on jigs shall be built to allow for extra large batches, and to prevent the center bar from being forced off, causing the batch to fall.

[Order 74-19, § 296-301-110, filed 5/6/74.]

**WAC 296-301-115 Padders—Nip guards.** All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-115, filed 5/6/74.]

**WAC 296-301-120 Drying cans.** (1) Pressure reducing valves and pressure gages. Pressure reducing valves and pressure gages shall conform to the ASME Code for Pressure Vessels, section VIII, 1968, Unfired Pressure Vessels.

(2) Vacuum collapse. If cans are not designed to prevent vacuum collapse, each can shall be equipped with one or more vacuum relief valves with openings of such a size as to prevent the collapse of the can if vacuum occurs.

[Order 74-19, § 296-301-120, filed 5/6/74.]

**WAC 296-301-125 Ironer.** (1) Each flat-work or collar ironer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The pressure rolls shall be covered or guarded so that the operator or other person cannot reach into the rolls without removing the guard. This may be either a vertical guard on all sides or a complete cover. If a vertical guard is used, the distance from the floor or working platform to the top of guard shall be not less than 6 feet.

[Order 74-19, § 296-301-125, filed 5/6/74.]

**WAC 296-301-130 Extractors.** (1) Centrifugal extractor.

(a) Cover. Each extractor shall be equipped with a metal cover.

(b) Interlocking device. Each extractor shall be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion, and also prevent the power operation of the basket while the cover is open.

(c) Brakes. Each extractor shall be equipped with a mechanically or electrically operated brake to quickly stop the basket when the power driving the basket is shut off.

(d) Maximum allowable speed. Each centrifugal extractor shall be effectively secured in position on the floor or foundation so as to eliminate unnecessary vibration, and shall not be operated at a speed greater than the manufacturer's rating, which shall be stamped where easily visible in letters not less than one-quarter inch in height. The maximum allowable speed shall be given in revolutions per minute (rpm).

(2) Engine drum extractor—Over-speed governor. Each engine individually driving an extractor shall be provided with an engine stop approved as specified in WAC 296-24-006, of the general safety and health standards, and a speed limit governor.

(3) Squeezer or wringer extractor—Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-130, filed 5/6/74.]

**WAC 296-301-135 Nip guards.** All nip guards for water mangle, starch mangle, backwasher (worsted yarn) crabbing machines, decating machines, shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-135, filed 5/6/74.]

(2007 Ed.)

**WAC 296-301-140 Sanforizing and palmer machine.**

A safety trip rod, cable, or wire center cord shall be provided across the front and back of all palmer cylinders extending the length of the face of the cylinder. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

[Order 74-19, § 296-301-140, filed 5/6/74.]

**WAC 296-301-145 Rope washers.** (1) Splash guard.

Splash guards shall be installed on all rope washers unless the machine is so designed as to prevent the water or liquid from splashing the operator, the floor, or working surface.

(2) Safety stop bar. A safety trip rod, cable or wire center cord shall be provided across the front and back of all rope washers extending the length of the face of the washer. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

[Order 74-19, § 296-301-145, filed 5/6/74.]

**WAC 296-301-150 Laundry washer tumbler or shaker.** (1) Interlocking device. Each drying tumbler, each double cylinder shaker or clothes tumbler, and each washing machine shall be equipped with an interlock device which will prevent the power operation of the inside cylinder when the outer door on the case or shell is open, and which will also prevent the outer door on the case or shell from being opened without shutting off the power. This should not prevent the movement of the inner cylinder by means of a hand operated mechanism or an "inching device."

(2) Means of holding covers or doors in open position. Each enclosed barrel shall also be equipped with adequate means for holding open the doors or covers of the inner and outer cylinders or shells while it is being loaded or unloaded.

(2) Means of holding covers or doors in open position. Each enclosed barrel shall also be equipped with adequate means for holding open the doors or covers of the inner and outer cylinders or shells while it is being loaded or unloaded.

[Order 74-19, § 296-301-150, filed 5/6/74.]

**WAC 296-301-155 Printing machine (roller type).** (1)

Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

(2) Crown wheel and roller gear nip protection. The engraved roller gears and the large crown wheel shall be provided with a protective disc which will enclose the nips of the in-running gears. Individual discs for each nip will be deemed to be in compliance with the provisions of WAC 296-301-04503(4).

[Order 74-19, § 296-301-155, filed 5/6/74.]

**WAC 296-301-160 Calenders.** The nip at the in-running side of the rolls shall be provided with a guard extending across the entire length of the nip and arranged to prevent the fingers of the workers from being pulled in between the rolls or between the guard and the rolls, and constructed so that the cloth can be fed into the rolls safely.

[Order 74-19, § 296-301-160, filed 5/6/74.]

**WAC 296-301-165 Rotary staple cutters.** A guard shall be installed completely enclosing the cutters to prevent the hands of the operator from reaching the cutting zone.

[Order 74-19, § 296-301-165, filed 5/6/74.]

**WAC 296-301-170 Clothing folding machine.** Cloth-folding machines shall meet the requirements of chapter 296-806 WAC, Machine safety.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-301-170, filed 6/29/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-17-094, § 296-301-170, filed 8/17/99, effective 12/1/99; Order 74-19, § 296-301-170, filed 5/6/74.]

**WAC 296-301-175 Hand bailing machine.** An angle-iron-handle stop guard shall be installed at the right angle to the frame of the machine. The stop guard shall be so designed and so located that it will prevent the handle from traveling beyond the vertical position should the handle slip from the operator's hand when the pawl has been released from the teeth of the takeup gear.

[Order 74-19, § 296-301-175, filed 5/6/74.]

**WAC 296-301-180 Roll bench.** Cleats shall be installed on the ends of roll benches.

[Order 74-19, § 296-301-180, filed 5/6/74.]

**WAC 296-301-185 Cuttle or swing folder (overhead type).** The bottom of the overhead folders shall be located not less than 7 feet from the floor or working surface.

[Order 74-19, § 296-301-185, filed 5/6/74.]

**WAC 296-301-190 Color-mixing room.** Floors in color-mixing rooms shall be constructed to drain easily.

[Order 74-19, § 296-301-190, filed 5/6/74.]

**WAC 296-301-195 Open tanks and vats for mixing and storage of hot or corrosive liquids.** (1) Guardrails shall be provided for open tanks and vats which conform to the requirements of WAC 296-24-750 through 296-24-75011.

(2) Shutoff valves. Boiling tanks, caustic tanks, and hot liquid containers, so located that the operator cannot see the contents from the floor or working area, shall have emergency shutoff valves controlled from a point not subject to danger of splash. Valves shall conform to the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-17-094, § 296-301-195, filed 8/17/99, effective 12/1/99; Order 74-19, § 296-301-195, filed 5/6/74.]

**WAC 296-301-200 Dye kettles and vats.** Pipes or drains of sufficient capacity to carry the contents safely away from the working area shall be installed where there are dye kettles and vats which may at any time contain hot or corrosive liquids. These shall not empty directly onto the floor.

[Order 74-19, § 296-301-200, filed 5/6/74.]

**WAC 296-301-205 Acid carboys.** Carboys shall be provided with inclinators, or the acid shall be withdrawn from the carboys by means of pumping without pressure in the carboy, or by means of hand operated siphons.

[Order 74-19, § 296-301-205, filed 5/6/74.]

[Title 296 WAC—p. 2268]

**WAC 296-301-210 Handling caustic soda and caustic potash.** Means shall be provided for handling and emptying caustic soda and caustic potash containers to prevent workers from coming in contact with the caustic (see WAC 296-301-220).

[Order 74-19, § 296-301-210, filed 5/6/74.]

**WAC 296-301-215 First aid.** The first-aid provisions of the safety and health core rule book, WAC 296-800-150 apply within the scope of chapter 296-301 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-301-215, filed 5/9/01, effective 9/1/01; 00-01-038, § 296-301-215, filed 12/7/99, effective 2/1/00; Order 74-19, § 296-301-215, filed 5/6/74.]

**WAC 296-301-220 Personal protective equipment.** (1) Personal protective equipment. Workers engaged in handling acids or caustics in bulk, repairing pipe lines containing acids or caustics, etc., shall be provided with personal protective equipment to conform to the requirements of WAC 296-800-160.

(2) Respiratory protection. Employers must provide respiratory protection as required in chapter 296-842 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-301-220, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-301-220, filed 5/9/01, effective 9/1/01; 99-17-094, § 296-301-220, filed 8/17/99, effective 12/1/99; Order 74-19, § 296-301-220, filed 5/6/74.]

**WAC 296-301-225 Workroom ventilation.** In all workrooms in which potentially toxic substances are used, the maximum allowable concentrations listed in WAC 296-62-075 through 296-62-07515, of the general occupational health standards, shall be maintained. Open surface tanks shall conform to the requirements of WAC 296-62-11021.

[Order 74-19, § 296-301-225, filed 5/6/74.]

## Chapter 296-303 WAC SAFETY STANDARDS FOR LAUNDRY MACHINERY AND OPERATIONS

### WAC

296-303-010	Laundry machinery and operations—Scope and application.
296-303-01001	General industrial safety standards.
296-303-01003	Definitions.
296-303-020	Point-of-operation guards—Scope and application.
296-303-02001	Washroom machines.
296-303-02003	Starching and drying machines.
296-303-02005	Finishing machines.
296-303-02007	Miscellaneous machines and equipment.
296-303-025	Operating rules—Scope and application.
296-303-02501	General.
296-303-02503	Mechanical.
296-303-030	Moving parts.
296-303-040	Starting and stopping devices.

**WAC 296-303-010 Laundry machinery and operations—Scope and application.** This chapter applies to moving parts of equipment used in laundries and to conditions peculiar to this industry, with special reference to the point of operation of laundry machines. This chapter does not apply to dry-cleaning operations.

[Order 74-18, § 296-303-010, filed 5/6/74.]

**WAC 296-303-01001 General industrial safety standards.** (1) General. These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(2) Additional requirements. The employer shall comply with the provisions of the standards referenced in this section. In the event of any conflict between this section and WAC 296-303-015 through 296-303-040, the requirements of WAC 296-303-015 through 296-303-040 shall apply. The provisions of this chapter shall prevail in the event of conflict with, or duplication of, provisions contained in chapters 296-24, 296-62, and 296-800 WAC.

(a) Industrial lighting. American National Standard Practice for Industrial Lighting, ANSI A11.1-1965 (R-1970).

(b) Floor and wall openings, railings, and toeboards. American National Standard Safety Requirements for Floor and Wall Openings, Railings, and Toeboards, ANSI A13.1-1956.

(c) Identification of piping systems. American National Standard Safety Standard for Mechanical Power Transmission Apparatus, ANSI A13.1-1956.

(d) Mechanical power transmission apparatus. American National Standard Safety Standard for Mechanical Power Transmission Apparatus, ANSI B15.1-1971.

(e) Pressure piping—Power piping. American National Standard Code for Pressure Piping—Power Piping, ANSI B31.1.0-1967. Addenda to the American National Standard Code for Pressure Piping—Power Piping, ANSI B31.1.0a-1969.

(f) Sanitation. American National Standard Requirements for Sanitation in Places of Employment, ANSI Z4.1-1968.

(g) Local exhaust systems. American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1960.

(h) Gas appliances and gas piping. American National Standard for the Installation of Gas Appliances and Gas Piping, ANSI Z21.30-1964.

(3) WAC 296-24-012 and 296-800-360 shall apply where applicable to this industry.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-303-01001, filed 5/9/01, effective 9/1/01; Order 74-18, § 296-303-01001, filed 5/6/74.]

**WAC 296-303-01003 Definitions.** (1) "Laundry" means an establishment wherein the washing, ironing, or other finishing of clothes, or any other textiles is done, but excluding printing, bleaching, dry cleaning, or dyeing of clothes or other textiles.

(2) "Marking machine" means a power-driven machine used for marking clothes or other textiles.

(3) "Washing machine" means a power-driven machine used for washing clothes or other textiles. It generally consists of a stationary case or shell inside of which is a revolving perforated cylinder.

(4) "Extractor" means a power-driven centrifugal machine used for removing surplus moisture from clothes or other textiles by centrifugal action.

(2007 Ed.)

(5) "Wringer" means one or more power-driven rolls used for removing surplus moisture from clothes or other textiles.

(6) "Starch mixer" means a power-driven machine used for mixing or processing starch.

(7) "Starching machine" means a power-driven machine used for the starching of clothes or other textiles.

(8) "Drying tumbler" means a machine within which clothes or other textiles are dried by air, and which usually consists of an enclosure inside of which is a revolving cylinder.

(9) "Shaker" (clothes tumbler) means a revolving cylinder used for shaking out clothes or other textiles.

(10) "Drying room" means an enclosure used for drying clothes or other textiles, and containing any power-driven mechanism.

(11) "Dampening machine" means a machine used for dampening clothes or other textiles.

(12) "Ironer" means a hand- or power-operated machine, with one or more rolls or heated surfaces in contact, used for ironing or smoothing clothes or other textiles.

(13) "Shaping machine" means a power-driven machine used to shape, mold, or otherwise finish clothes or other textiles; this term shall also include shaping tables, stands, or shelves upon which the machine may be mounted.

(14) "Sewing machine" means a machine used for sewing or stitching clothes or other textiles.

(15) "Guarded" means covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers or casings, barrier rails, safety bars, or screens, to eliminate the possibility of accidental contact with, or dangerous approach by, persons or objects.

(16) "Enclosed" means that the object or equipment or part thereof is so guarded that accidental contact at the point of danger, during the regular operation of the equipment, is not possible.

(17) "Safety interlock" means a device that will prevent the operation of the machine while the cover or door is open or unlocked and will hold the cover or door closed and locked while the basket or cylinder is in motion.

(18) "Moving parts" means gears, sprockets, revolving shafts, clutches, belts, pulleys, or other revolving or reciprocating parts that are attached to, or form an integral part of, a machine.

(19) "Power transmission" pertains to equipment such as shafting, gears, belts, pulleys, or other parts used for transmitting power to the machine, and shall include prime movers.

(20) "Prime movers" includes steam, gas, oil, and air engines or motors, and steam and hydraulic turbines.

(21) "Point of operation" means the point or points at which clothes or other textiles are inserted or manipulated in the operation of the machine.

[Order 74-18, § 296-303-01003, filed 5/6/74.]

**WAC 296-303-020 Point-of-operation guards—Scope and application.** All sections of this chapter which include WAC 296-303-020 in the section number apply to point-of-operation guards.

[Order 74-18, § 296-303-020, filed 5/6/74.]

**WAC 296-303-02001 Washroom machines.** (1) Marking machine. Each power marking machine shall be equipped with a spring-compression device of such design as to prevent injury to fingers, should they be caught between the marking plunger and platen; or the marking machine shall be equipped with a control mechanism that will require the simultaneous action of both hands to operate the machine; or there shall be a guard that will act as a barrier in front of, and which will prevent the operator's fingers from coming into contact with the marking plunger.

(2) Washing machine.

(a) Each washing machine shall be equipped with an interlocking device that will prevent the inside cylinder from moving under power when the outer door on the case or shell is open, and will also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an "inching device."

(b) Each washing machine shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded. Spring loaded devices are an acceptable means.

(3) Extractor.

(a) Each extractor shall be equipped with a metal cover.

(b) Each extractor shall be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion, and will also prevent the power operation of the basket while the cover is not fully closed and secured. This device should not prevent the movement of the basket by hand to ensure an even loading.

(c) Each extractor shall also be effectively secured in position on the floor or foundation so as to eliminate unnecessary vibrations, and shall not be operated at a speed greater than that given in the manufacturer's rating, which shall be stamped on the inside of the basket where it is easily visible, in letters not less than one-fourth inch in height. The maximum permissible speed shall be given in revolutions per minute.

(d) Each engine individually driving an extractor shall be provided with an engine stop approved as specified in WAC 296-24-006, of the general safety and health standards, and a speed-limit governor. It is suggested that where an extractor is driven by a direct-current motor a "no field" release be installed to prevent overspeed, which may result from an open or broken field.

(4) Power wringer. Each power wringer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine.

[Order 74-18, § 296-303-02001, filed 5/6/74.]

**WAC 296-303-02003 Starching and drying machines.** (1) Starching machine (cylinder or box type). Each starching machine, cylinder or box type, shall be enclosed or guarded so as to prevent the operator or other person from coming into accidental contact with the cylinder or box while the machine is in motion.

(2) Drying-room fan. Each drying-room fan, any part of which is within 7 feet of the floor or working platform, shall

be guarded with wire mesh or screen of not less than No. 16 gauge, the openings of which will reject a ball one-half inch in diameter.

(3) Drying tumbler.

(a) Each drying tumbler shall be equipped with an interlocking device that will prevent the inside cylinder from moving under power when the outer door on the case or shell is open, and also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an inching device.

(b) Each drying tumbler shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded.

(4) Shaker (clothes tumbler).

(a) Each shaker or clothes tumbler of the single-cylinder type shall be equipped with a device that will automatically prevent the tumbler from moving while the door is open.

(b) The tumbler shall also be enclosed or guarded so as to prevent accidental contact by the operator or other person while the machine is in motion.

(c) Each shaker or clothes tumbler of the double-cylinder type shall be equipped with an interlocking device that will prevent the inside cylinder from moving when the outer door on the case or shell is open and will also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an inching device.

(d) Each shaker or clothes tumbler of the double-cylinder type shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded.

(5) Exception. Provisions of (3), (4)(a), (c) and (d) of this section shall not apply to shakeout or conditioning tumblers where the clothes are loaded into the open end of the revolving cylinder and are automatically discharged out of the opposite end.

[Order 74-18, § 296-303-02003, filed 5/6/74.]

**WAC 296-303-02005 Finishing machines.** (1) Dampening machine. Each roll-dampening machine shall be so equipped that the rolls will be entirely enclosed and so arranged as to prevent the fingers of the operator or other person from being caught between the rolls. This may be accomplished by:

(a) A slot or hopper;

(b) A rod or strip located directly in front of the feed and extending the full length of the rolls.

(2) Ironer.

(a) Each flat-work or collar ironer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The pressure rolls shall be covered or guarded so that the operator or other person cannot reach into the rolls without removing the guard. This may be either a vertical guard on all sides or a complete cover. If a vertical guard is

used, the distance from the floor or working platform to the top of guard shall be not less than six feet.

(b) Each body-type ironer, roll or shoe type, including sleeve and band ironers, shall be equipped with a safety bar or other guard across the entire length of the feed roll or shoe, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The hot roll or shoe shall also be covered in such a way that the operator or other person cannot come into contact with the heated surfaces.

(c) Each combined rotary-bosom and coat ironer shall be equipped with a safety bar or other guard across the entire length of the feed roll or shoe, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The hot roll or shoe shall also be covered in such a way that the operator or other person cannot come into contact with the heated surfaces.

(d) Each ironing press (excluding hand or foot powered ones) shall be equipped with a guard or means that will prevent the fingers of the operator or other person from being caught between the ironing surfaces.

[Order 74-18, § 296-303-02005, filed 5/6/74.]

**WAC 296-303-02007 Miscellaneous machines and equipment.** (1) Sewing machine. Each sewing machine shall be equipped with a guard permanently attached to the machine, so that the operator's fingers cannot pass under the needle. It shall be of such form that the needle can be conveniently threaded without removing the guard. This requirement will not apply to domestic-type sewing machines having a presser-foot which is in the "down" position during operation of the machine.

(2) Exhaust or ventilating fans. Each exhaust or ventilating fan within seven feet of the floor or working platform shall be completely covered with wire mesh of not less than No. 16 gauge, and with openings that will reject a ball one-half inch in diameter.

(3) Steam pipes.

(a) All steam pipes that are within seven feet of the floor or working platform, and with which the worker may come into contact, shall be insulated or covered with a heat-resistant material or shall be guarded to prevent direct contact with the worker.

(b) Where pressure-reducing valves are used, one or more relief or safety valves shall be provided on the low-pressure side of the reducing valve, in case the piping or equipment on the low-pressure side does not meet the requirements for full initial pressure. The relief or safety valve shall be located adjacent to, or as close as possible to, the reducing valve. Relief and safety valves vented to the atmosphere shall be so constructed as to prevent injury or damage caused by fluid escaping from relief or safety valves. The vents shall be of ample size and as short and direct as possible. The combined discharge capacity of the relief valves shall be such that the pressure rating of the lower-pressure piping and equipment will not be exceeded if the reducing valve sticks or fails to open.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-303-02007, filed 5/15/89, effective 6/30/89; Order 74-18, § 296-303-02007, filed 5/6/74.]

(2007 Ed.)

**WAC 296-303-025 Operating rules—Scope and application.** All sections of this chapter which include WAC 296-303-025 in the section number apply to operating rules.

[Order 74-18, § 296-303-025, filed 5/6/74.]

**WAC 296-303-02501 General.** (1) Floors.

(a) The floors of every room in a laundry that are used for washing purposes shall be properly constructed of cement, tile, or similar material. The floors shall be water-tight, free from projections, crevices, or dangerous gradients. They shall be maintained in good repair and so drained that no water may accumulate.

(b) The floors of every room except washrooms shall be constructed of hardwood or any impervious material, free from protruding nails, splinters, or loose boards, and shall be so maintained.

(2) Table tops, shelves, and machine woodwork. Table tops, shelves, and machine woodwork shall be constructed of materials properly surfaced, finished free from splinters, and so maintained.

(3) Markers. Markers and others handling soiled clothes shall be warned against touching the eyes, mouth, or any part of the body on which the skin has been broken by a scratch or abrasion; and they shall be cautioned not to touch or eat food until their hands have been thoroughly washed.

(4) Ventilation. Where artificial ventilation is necessary to the maintenance of comfortable working conditions, an adequate ventilating system shall be installed as specified in WAC 296-62-110 of the general occupational health standards.

(5) Instruction of employees. Employees shall be properly instructed as to the hazards of their work and be instructed in safe practices, by bulletins, printed rules, and verbal instructions.

[Order 74-18, § 296-303-02501, filed 5/6/74.]

**WAC 296-303-02503 Mechanical.** (1) Safety guards.

(a) No safeguard, safety appliance, or device attached to, or forming an integral part of any machinery shall be removed or made ineffective except for the purpose of making immediate repairs or adjustments. Any such safeguard, safety appliance, or device removed or made ineffective during the repair or adjustment of such machinery shall be replaced immediately upon the completion of such repairs or adjustments.

(b) No machine shall be operated until such repairs and adjustments have been made and the machine is in good working condition.

(2) Steam-pressure apparatus. Steam machines shall not be operated at a pressure above that given by the manufacturer's pressure rating as shown on name plate. If the steam source is at a pressure higher than that given by the manufacturer's rating, a stop valve, reducing valve, pressure gauge, and safety valve shall be installed, in the order named, from the source. The safety valve shall be located in a nonhazardous place.

(3) Machine adjustments. No moving parts of any machine shall be oiled, cleaned, adjusted, or repaired while said machine is in operation or in motion except that the rolls of adjusting machines not equipped with hand-power means

shall be operated at the slowest speed possible with an operator constantly at the starting mechanism.

(4) Extractors. Each extractor shall be dismantled and inspected at least once a year and, if necessary, repaired. Overdriven extractors, if provided with handholes through which basket and rings can be inspected, need not be dismantled.

[Order 74-18, § 296-303-02503, filed 5/6/74.]

**WAC 296-303-030 Moving parts.** (1) Machine guarding (other than point of operation). Moving parts of machines, such as gears, sprockets, belts, pulleys, and shafts, shall be guarded in accordance with the requirements of chapter 296-806 WAC, Machine safety.

(2) Prime-mover guarding. Moving parts of prime movers such as fly-wheels, cranks and connecting rods, tail rods or extension piston rods, and governor balls, shall be guarded in accordance with the requirements of chapter 296-806 WAC, Machine safety.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-303-030, filed 6/29/04, effective 1/1/05; Order 74-18, § 296-303-030, filed 5/6/74.]

**WAC 296-303-040 Starting and stopping devices.** (1) Each power-driven machine shall be provided with means for disconnecting from the source of power. Starting and stopping devices for machines shall be so located as to be operable from the front of the machine, and so constructed as to allow proper guarding of belts and pulleys.

(2) Doors of washing machines, extractors, and tumbler/shaker dryer machines, shall have a cut-off micro switch or other method to shut off power when loading doors are opened, making inner cylinder, tumbler, or shaker mechanisms inoperative while the door is open. In those situations where the cylinder or mechanism continues to rotate/move, and present a hazard after the power is off, an interlocking device, breaking switch, or a time-delay switch is additionally required to prevent injury.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-303-040, filed 5/15/89, effective 6/30/89; Order 74-18, § 296-303-040, filed 5/6/74.]

## Chapter 296-304 WAC

### SAFETY STANDARDS FOR SHIP REPAIRING, SHIPBUILDING AND SHIPBREAKING

#### WAC

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**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

296-304-01005 Fire protection in shipyards. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01005, filed 9/20/05, effective 12/1/05. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-01005, filed 1/18/95, effective 3/10/95.] Decodedified by 06-08-003, filed 3/23/06, effective 4/23/06. Recodified as § 296-304-01006.

296-304-04003 Fire prevention. [Order 76-7, § 296-304-04003, filed 3/1/76; Order 74-25, § 296-304-04003, filed 5/7/74.] Repealed by 05-19-086, filed 9/20/05, effective 12/1/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.

**WAC 296-304-010 Scope and application.** (1) The provisions and standards of the general safety and health standards, chapters 296-24, 296-62 and 296-800 WAC, and such other codes and standards as are promulgated by the department of labor and industries which are applicable to all industries, shall be applicable in the ship repairing, shipbuilding, or shipbreaking industries whenever the employees are covered under the Washington State Industrial Safety and Health Act, chapter 49.17 RCW. The rules of this chapter and the rules of the aforementioned chapters 296-24, 296-62, and 296-800 WAC are applicable to all ship repairing, shipbuilding, and shipbreaking industries and operations, provided that such rules shall not be applicable to those operations under the exclusive safety jurisdiction of the federal government.

(2) The responsibility for compliance with these regulations is placed upon "employers" as defined in WAC 296-304-01001.

(3) It is not the intent of these regulations to place additional responsibilities or duties on owners, operators, agents or masters of vessels unless such persons are acting as employers, nor is it the intent of these regulations to relieve such owners, operators, agents or masters of vessels from responsibilities or duties now placed upon them by law, regulation or custom.

(4) The responsibilities placed upon the competent person herein shall be deemed to be the responsibilities of the employer.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-304-010, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-010, filed 12/26/97, effective 3/1/98. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-010, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-010, filed 1/18/95, effective 3/10/95; 89-11-035 (Order 89-03), § 296-304-010, filed 5/15/89, effective 6/30/89; Order 75-6, § 296-304-010, filed 3/10/75; Order 74-25, § 296-304-010, filed 5/7/74.]

**WAC 296-304-01001 Definitions. "Alarm"** - A signal or message from a person or device that indicates that there is a fire, medical emergency, or other situation that requires emergency response or evacuation. At some shipyards, this may be called an "incident" or a "call for service."

**"Alarm system"** - A system that warns employees at the worksite of danger.

**"Anchorage"** - A secure point to attach lifelines, lanyards, or deceleration devices.

**"Body belt"** - A strap with means to both secure it around the waist and to attach it to a lanyard, lifeline, or deceleration device. Body belts may be used only in fall restraint or positioning device systems and may not be used for fall arrest. Body belts must be at least one and five-eighths inches (4.13 cm) wide.

**"Body harness"** - Straps to secure around an employee so that fall arrest forces are distributed over at least the thighs, shoulders, chest and pelvis with means to attach it to other components of a personal fall arrest system.

**"Class II standpipe system"** - A one and one-half inch (3.8 cm) hose system which provides a means for the control or extinguishment of incipient stage fires.

**"Cold work"** - Work that does not involve riveting, welding, burning, or other fire-producing or spark-producing operations.

**"Contract employer"** - An employer, such as a painter, joiner, carpenter, or scaffolding subcontractor, who performs work under contract to the host employer or to another employer under contract to the host employer at the host employer's worksite. This excludes employers who provide incidental services that do not influence shipyard employment (such as mail delivery or office supply services).

**"Competent person"** - A person who can recognize and evaluate employee exposure to hazardous substances or to other unsafe conditions and can specify the necessary protection and precautions necessary to ensure the safety of employees as required by these standards.

**"Confined space"** - A small compartment with limited access such as a double bottom tank, cofferdam, or other small, confined space that can readily create or aggravate a hazardous exposure.

**"Connector"** - A device used to connect parts of a personal fall arrest system or parts of a positioning device system together. It may be:

- An independent component of the system (such as a carabiner); or
- An integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness or a snaphook spliced or sewn to a lanyard or self-retracting lanyard).

**"Dangerous atmosphere"** - An atmosphere that may expose employees to the risk of death, incapacitation, injury, acute illness, or impairment of ability to self-rescue (i.e., escape unaided from a confined or enclosed space).

**"Deceleration device"** - A mechanism, such as a rope grab, rip stitch lanyard, specially woven lanyard, tearing or deforming lanyard, or automatic self-retracting lifeline/lanyard, that serves to dissipate a substantial amount of energy during a fall arrest, or to limit the energy imposed on an employee during fall arrest.

**"Deceleration distance"** - The additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured from the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, to the location of that attachment point after the employee comes to a full stop.

**"Designated area"** - An area established for hot work after an inspection that is free of fire hazards.

**"Director"** - The director of the department of labor and industries or a designated representative.

**"Drop test"** - A method utilizing gauges to ensure the integrity of an oxygen fuel gas burning system. The method requires that the burning torch is installed to one end of the oxygen and fuel gas lines and then the gauges are attached to the other end of the hoses. The manifold or cylinder supply valve is opened and the system is pressurized. The manifold or cylinder supply valve is then closed and the gauges are watched for at least sixty seconds. Any drop in pressure indicates a leak.

**"Emergency operations"** - Activities performed by fire response organizations that are related to: Rescue, fire suppression, emergency medical care, and special operations or activities that include responding to the scene of an incident and all activities performed at that scene.

**"Employee"** - Any person engaged in ship repairing, ship building, or ship breaking or related employment as defined in these standards.

**"Employer"** - An employer with employees who are employed, in whole or in part, in ship repair, ship building and ship breaking, or related employment as defined in these standards.

**"Enclosed space"** - A space, other than a confined space, that is enclosed by bulkheads and overhead. It includes cargo holds, tanks, quarters, and machinery and boiler spaces.

**"Equivalent"** - Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the method or item specified in the standard.

**"Fire hazard"** - A condition or material that may start or contribute to the spread of fire.

**"Fire protection"** - Methods of providing fire prevention, response, detection, control, extinguishment, and engineering.

**"Fire response"** - The activity taken by the employer at the time of an emergency incident involving a fire at the worksite, including fire suppression activities carried out by internal or external resources or a combination of both, or total or partial employee evacuation of the area exposed to the fire.

**"Fire response employee"** - A shipyard employee who carries out the duties and responsibilities of shipyard fire fighting in accordance with the fire safety plan.

**"Fire response organization"** - An organized group knowledgeable, trained, and skilled in shipyard fire fighting operations that responds to shipyard fire emergencies, including: Fire brigades, shipyard fire departments, private or contractual fire departments, and municipal fire departments.

**"Fire suppression"** - The activities involved in controlling and extinguishing fires.

**"Fire watch"** - The activity of observing and responding to the fire hazards associated with hot work in shipyard employment and the employees designated to do so.

**"Fixed extinguishing system"** - A permanently installed fire protection system that either extinguishes or controls fire occurring in the space it protects.

**"Flammable liquid"** - Any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture.

**"Free fall"** - To fall before a personal fall arrest system begins to apply force to arrest the fall.

**"Free fall distance"** - The vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before the device operates and fall arrest forces occur.

**"Gangway"** - A ramp-like or stair-like means to board or leave a vessel including accommodation ladders, gang-planks and brows.

**"Hazardous substance"** - A substance likely to cause injury because it is explosive, flammable, poisonous, corrosive, oxidizing, irritant, or otherwise harmful.

**"Hose systems"** - Fire protection systems consisting of a water supply, approved fire hose, and a means to control the flow of water at the output end of the hose.

**"Host employer"** - An employer who is in charge of coordinating work or who hires other employers to perform work at a multiemployer workplace.

**"Hot work"** - Riveting, welding, burning or other fire or spark producing operations.

**"Incident management system"** - A system that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations; the system is also referred to as an "incident command system (ICS)."

**"Incipient stage fire"** - A fire, in the initial or beginning stage, which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

**"Inerting"** - The displacement of the atmosphere in a permit space by noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. This procedure produces an IDLH oxygen-deficient atmosphere.

**"Interior structural fire fighting operations"** - The physical activity of fire response, rescue, or both involving a fire beyond the incipient stage inside of buildings, enclosed structures, vessels, and vessel sections.

**"Lanyard"** - A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

**"Lifeline"** - A component consisting of a flexible line to connect to an anchorage at one end to hang vertically (vertical lifeline), or to connect to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**"Lower levels"** - Those areas or surfaces to which an employee can fall. Such areas or surfaces include but are not

limited to ground levels, floors, ramps, tanks, materials, water, excavations, pits, vessels, structures, or portions thereof.

**"Multiemployer workplace"** - A workplace where there is a host employer and at least one contract employer.

**"Personal alert safety system (PASS)"** - A device that sounds a loud signal if the wearer becomes immobilized or is motionless for thirty seconds or more.

**"Personal fall arrest system"** - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, a deceleration device, a lifeline, or a suitable combination.

**"Physical isolation"** - The elimination of a fire hazard by removing the hazard from the work area (at least thirty-five feet for combustibles), by covering or shielding the hazard with a fire-resistant material, or physically preventing the hazard from entering the work area.

**"Physically isolated"** - Positive isolation of the supply from the distribution piping of a fixed extinguishing system. Examples of ways to physically isolate include: Removing a spool piece and installing a blank flange; providing a double block and bleed valve system; or completely disconnecting valves and piping from all cylinders or other pressure vessels containing extinguishing agents.

**"Portable unfired pressure vessel"** - A pressure container or vessel used aboard ship, other than the ship's equipment, containing liquids or gases under pressure. This does not include pressure vessels built to Department of Transportation regulations under 49 CFR Part 78, Subparts C and H.

**"Positioning device system"** - A body belt or body harness system rigged to allow an employee to be supported at an elevated vertical surface, such as a wall or window, and to be able to work with both hands free while leaning.

**"Powder actuated fastening tool"** - A tool or machine that drives a stud, pin, or fastener by means of an explosive charge.

**"Protected space"** - Any space into which a fixed extinguishing system can discharge.

**"Proximity fire fighting"** - Specialized fire fighting operations that require specialized thermal protection and may include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of conductive, convective, and radiant heat such as aircraft fires, bulk flammable gas fires, and bulk flammable liquid fires. Proximity fire fighting operations usually are exterior operations but may be combined with structural fire fighting operations. Proximity fire fighting is not entry fire fighting.

**"Qualified instructor"** - A person with specific knowledge, training, and experience in fire response or fire watch activities to cover the material found in WAC 296-304-01019 (2) or (3).

**"Qualified person"** - A person who has successfully demonstrated the ability to solve or resolve problems related to the subject matter and work by possessing a recognized degree or certificate of professional standing or by extensive knowledge, training, and experience.

**"Related employment"** - Any employment related to or performed in conjunction with ship repairing, ship building

or ship breaking work, including, but not limited to, inspecting, testing, and serving as a watchman.

**"Rescue"** - Locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and transporting the injured to an appropriate health care facility.

**"Restraint (tether) line"** - A line from an anchorage, or between anchorages, to which the employee is secured so as to prevent the employee from walking or falling off an elevated work surface.

Note: A restraint line is not necessarily designed to withstand forces resulting from a fall.

**"Rope grab"** - A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest the fall of an employee. A rope grab usually uses the principle of inertial locking, cam/level locking or both.

**"Shall" or "must"** - Mandatory.

**"Ship breaking"** - Breaking down a vessel's structure to scrap the vessel, including the removal of gear, equipment or any component part of a vessel.

**"Ship building"** - Construction of a vessel, including the installation of machinery and equipment.

**"Ship repairing"** - Repair of a vessel including, but not limited to, alterations, conversions, installations, cleaning, painting, and maintenance.

**"Shipyard fire fighting"** - The activity of rescue, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, aircraft, or similar properties involved in a fire or emergency situation.

**"Small hose system"** - A system of hoses ranging in diameter from 5/8" (1.6 cm) up to 1 1/2" (3.8 cm) which is for the use of employees and which provides a means for the control and extinguishment of incipient stage fires.

**"Standpipe"** - A fixed fire protection system consisting of piping and hose connections used to supply water to approved hose lines or sprinkler systems. The hose may or may not be connected to the system.

**"Vessel"** - Every watercraft for use as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01001, filed 9/20/05, effective 12/1/05; 03-04-099, § 296-304-01001, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-01001, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-01001, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-01001, filed 3/1/76; Order 74-25, § 296-304-01001, filed 5/7/74.]

**WAC 296-304-01003 Reference specifications, standards, and codes.** Specifications, standards, and codes of agencies of the U.S. government, to the extent specified in the text, form a part of these regulations. In addition, the specifications, standards, and codes of organizations which are not agencies of the U.S. government, in effect on the date of the promulgation of these regulations as listed below, to the extent specified in the text, form a part of these standards:

National Fire Protection Association, 60 Batterymarch Street, Boston, Mass.02110,

[Title 296 WAC—p. 2276]

Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Ill.60611,

United States of America Standard Safety Code for Portable Wood Ladders, A14.1-1975, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

United States of America Standard Safety Code for Portable Metal Ladders, A14.2-1972, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

United States of America Standard Safety Code for Head, Eye, and Respiratory Protection, Z2.1-1959, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Unfired Pressure Vessels, American Society of Mechanical Engineers, 345 East 47th Street, New York, N.Y. 10017,

Threshold Limit Values, American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, Ohio 45202,

United States of America Standards Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1-1964, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-01003, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-01003, filed 5/7/74.]

#### **WAC 296-304-01006 Fire protection in shipyards.**

(1) **Purpose.** The purpose of this section is to require employers to protect all employees from fire hazards in shipyard employment, including employees engaged in fire response activities.

(2) **Scope.** This section covers employers with employees engaged in shipyard employment aboard vessels and vessel sections, and on land-side operations regardless of geographic location.

(3) **Employee participation.** The employer must provide ways for employees or employee representatives, or both to participate in developing and periodically reviewing programs and policies adopted to comply with this section.

#### **(4) Multiemployer worksites.**

(a) **Host employer responsibilities.** The host employer's responsibilities are to:

(i) Inform all employers at the worksite about the content of the fire safety plan including hazards, controls, fire safety and health rules, and emergency procedures;

(ii) Make sure the safety and health responsibilities for fire protection are assigned as appropriate to other employers at the worksite; and

(iii) If there is more than one host employer, each host employer must communicate relevant information about fire-related hazards to other host employers. When a vessel owner or operator (temporarily) becomes a host shipyard employer by directing the work of ships' crews on repair or modification of the vessel or by hiring other contractors directly, the vessel owner or operator must also comply with these provisions for host employers.

(b) **Contract employer responsibilities.** The contract employer's responsibilities are to:

(i) Make sure that the host employer knows about the fire-related hazards associated with the contract employer's work and what the contract employer is doing to address them; and

(ii) Advise the host employer of any previously unidentified fire-related hazards that the contract employer identifies at the worksite.

[06-08-003, recodified as § 296-304-01006, filed 3/23/06, effective 4/23/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01005, filed 9/20/05, effective 12/1/05. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-01005, filed 1/18/95, effective 3/10/95.]

**WAC 296-304-01007 Fire safety plan. (1) Employer responsibilities.** The employer must develop and implement a written fire safety plan that covers all the actions that employers and employees must take to ensure employee safety in the event of a fire. (See Appendix A to this section for a model fire safety plan.)

(2) **Plan elements.** The employer must include the following information in the fire safety plan:

- (a) Identification of the significant fire hazards;
- (b) Procedures for recognizing and reporting unsafe conditions;
- (c) Alarm procedures;
- (d) Procedures for notifying employees of a fire emergency;
- (e) Procedures for notifying fire response organizations of a fire emergency;
- (f) Procedures for evacuation;
- (g) Procedures to account for all employees after an evacuation; and
- (h) Names, job titles, or departments for individuals who can be contacted for further information about the plan.

(3) **Reviewing the plan with employees.** The employer must review the plan with each employee at the following times:

- (a) By March 1, 2006, for employees who are currently working;
- (b) Upon initial assignment for new employees; and
- (c) When the actions the employee must take under the plan change because of a change in duties or a change in the plan.

(4) **Additional employer requirements.** The employer also must:

- (a) Keep the plan accessible to employees, employee representatives, and WISHA;
- (b) Review and update the plan whenever necessary, but at least annually;
- (c) Document that affected employees have been informed about the plan as required by this subsection; and
- (d) Ensure any outside fire response organization that the employer expects to respond to fires at the employer's worksite has been given a copy of the current plan.

(5) **Contract employers.** Contract employers in shipyard employment must have a fire safety plan for their employees, and this plan must comply with the host employer's fire safety plan.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01007, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-01009 Precautions for hot work. (1) General requirements.**

(a) **Designated areas.** The employer may designate areas for hot work in sites such as vessels, vessel sections, fabricating shops, and subassembly areas that are free of fire hazards.

(b) **Nondesignated areas.**

(i) Before authorizing hot work in a nondesignated area, the employer must visually inspect the area where hot work is to be performed, including adjacent spaces, to ensure the area is free of fire hazards, unless a marine chemist's certificate or shipyard competent person's log is used for authorization.

(ii) The employer shall authorize employees to perform hot work only in areas that are free of fire hazards, or that have been controlled by physical isolation, fire watches, or other positive means.

**Note:** The requirements of (b) of this subsection apply to all hot work operations in shipyard employment except those covered by WAC 296-304-02007.

(2) **Specific requirements.**

(a) **Maintaining fire hazard-free conditions.** The employer must keep all hot work areas free of new hazards that may cause or contribute to the spread of fire. Unexpected energizing and energy release are covered by WAC 296-304-120. Exposure to toxic and hazardous substances is covered in chapter 296-841 WAC, Respiratory hazards; chapter 296-802 WAC, Employee medical and exposure records; and WAC 296-800-170, Employer chemical hazard communication—Introduction.

(b) **Fuel gas and oxygen supply lines and torches.** The employer must make sure that:

- (i) No unattended fuel gas and oxygen hose lines or torches are in confined spaces;
- (ii) No unattended charged fuel gas and oxygen hose lines or torches are in enclosed spaces for more than fifteen minutes;

(iii) All fuel gas and oxygen hose lines are disconnected at the supply manifold at the end of each shift; and

(iv) All disconnected fuel gas and oxygen hose lines are rolled back to the supply manifold or to open air to disconnect the torch; or extended fuel gas and oxygen hose lines are not reconnected at the supply manifold unless the lines are given a positive means of identification when they were first connected and the lines are tested using a drop test or other positive means to ensure the integrity of fuel gas and oxygen burning system.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01009, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-01011 Fire watches. (1) Written fire watch policy.** The employer must create and keep current a written policy that specifies the following requirements for employees performing fire watch in the workplace:

- (a) The training employees must be given (WAC 296-304-01019(3) contains detailed fire watch training requirements);
- (b) The duties employees are to perform;
- (c) The equipment employees must be given; and

(d) The personal protective equipment (PPE) that must be made available and worn as required by WAC 296-304-090.

(2) **Posting fire watches.** The employer must post a fire watch if during hot work any of the following conditions are present:

(a) Slag, weld splatter, or sparks might pass through an opening and cause a fire;

(b) Fire-resistant guards or curtains are not used to prevent ignition of combustible materials on or near decks, bulkheads, partitions, or overheads;

(c) Combustible material closer than thirty-five feet (10.7 m) to the hot work in either the horizontal or vertical direction cannot be removed, protected with flame-proof covers, or otherwise shielded with metal or fire-resistant guards or curtains;

(d) The hot work is carried out on or near insulation, combustible coatings, or sandwich-type construction that cannot be shielded, cut back, or removed, or in a space within a sandwich-type construction that cannot be inerted;

(e) Combustible materials adjacent to the opposite sides of bulkheads, decks, overheads, metal partitions, or sandwich-type construction may be ignited by conduction or radiation;

(f) The hot work is close enough to cause ignition through heat radiation or conduction on the following:

(i) Insulated pipes, bulkheads, decks, partitions, or overheads; or

(ii) Combustible materials and/or coatings;

(g) The work is close enough to unprotected combustible pipe or cable runs to cause ignition; or

(h) A marine chemist, a Coast Guard-authorized person, or a shipyard competent person, as defined in WAC 296-304-020, requires that a fire watch be posted.

(3) **Assigning employees to fire watch duty.**

(a) The employer must not assign other duties to a fire watch while the hot work is in progress.

(b) Employers must ensure that employees assigned to fire watch duty:

(i) Have a clear view of and immediate access to all areas included in the fire watch;

(ii) Are able to communicate with workers exposed to hot work;

(iii) Are authorized to stop work if necessary and restore safe conditions within the hot work area;

(iv) Remain in the hot work area for at least thirty minutes after completion of the hot work, unless the employer or its representative surveys the exposed area and makes a determination that there is no further fire hazard;

(v) Are trained to detect fires that occur in areas exposed to the hot work;

(vi) Attempt to extinguish any incipient stage fires in the hot work area that are within the capability of available equipment and within the fire watch's training qualifications, as defined in WAC 296-304-01019;

(vii) Alert employees of any fire beyond the incipient stage; and

(viii) If unable to extinguish fire in the areas exposed to the hot work, activate the alarm.

(c) The employer must ensure that employees assigned to fire watch are physically capable of performing these duties.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01011, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-01013 Fire response. (1) Employer responsibilities.** The employer must:

(a) Decide what type of response will be provided and who will provide it; and

(b) Create, maintain, and update a written policy that:

(i) Describes the internal and outside fire response organizations that the employer will use; and

(ii) Defines what evacuation procedures employees must follow, if the employer chooses to require a total or partial evacuation of the worksite at the time of a fire.

(2) **Required written policy information.**

(a) **Internal fire response.** If an internal fire response is to be used, the employer must include the following information in the employer's written policy:

(i) The basic structure of the fire response organization;

(ii) The number of trained fire response employees;

(iii) The fire response functions that may need to be carried out;

(iv) The minimum number of fire response employees necessary, the number and types of apparatuses, and a description of the fire suppression operations established by written standard operating procedures for each type of fire response at the employer's facility;

(v) The type, amount, and frequency of training that must be given to fire response employees; and

(vi) The procedures for using protective clothing and equipment.

(b) **Outside fire response.** If an outside fire response organization is used, the employer must include the following information in the written policy:

(i) The types of fire suppression incidents to which the fire response organization is expected to respond at the employer's facility or worksite;

(ii) The liaisons between the employer and the outside fire response organizations; and

(iii) A plan for fire response functions that:

(A) Addresses procedures for obtaining assistance from the outside fire response organization;

(B) Familiarizes the outside fire response organization with the layout of the employer's facility or worksite, including access routes to controlled areas, and site-specific operations, occupancies, vessels or vessel sections, and hazards; and

(C) Sets forth how hose and coupling connection threads are to be made compatible and includes where the adapter couplings are kept; or

(D) States that the employer will not allow the use of incompatible hose connections.

(c) **A combination of internal and outside fire response.** If a combination of internal and outside fire response is to be used, the employer must include the following information, in addition to the requirements in (a) and (b) of this subsection, in the written policy:

(i) The basic organizational structure of the combined fire response;

- (ii) The number of combined trained fire responders;
  - (iii) The fire response functions that may need to be carried out;
  - (iv) The minimum number of fire response employees necessary, the number and types of apparatuses, and a description of the fire suppression operations established by written standard operating procedures for each particular type of fire response at the worksite; and
  - (v) The type, amount, and frequency of joint training with outside fire response organizations if given to fire response employees.
- (d) **Employee evacuation.** The employer must include the following information in the employer's written policy:
- (i) Emergency escape procedures;
  - (ii) Procedures to be followed by employees who may remain longer at the worksite to perform critical shipyard employment operations during the evacuation;
  - (iii) Procedures to account for all employees after emergency evacuation is completed;
  - (iv) The preferred means of reporting fires and other emergencies; and
  - (v) Names or job titles of the employees or departments to be contacted for further information or explanation of duties.
- (e) **Rescue and emergency response.** The employer must include the following information in the employer's written policy:
- (i) A description of the emergency rescue procedures; and
  - (ii) Names or job titles of the employees who are assigned to perform them.
- (3) **Medical requirements for shipyard fire response employees.** The employer must ensure that:
- (a) All fire response employees receive medical examinations to assure that they are physically and medically fit for the duties they are expected to perform;
  - (b) Fire response employees, who are required to wear respirators in performing their duties, meet the medical requirements of WAC 296-304-09007;
  - (c) Each fire response employee has an annual medical examination; and
  - (d) The medical records of fire response employees are kept in accordance with chapter 296-802 WAC, Employee medical and exposure records.
- (4) **Organization of internal fire response functions.** The employer must:
- (a) Organize fire response functions to ensure enough resources to conduct emergency operations safely;
  - (b) Establish lines of authority and assign responsibilities to ensure that the components of the internal fire response are accomplished;
  - (c) Set up an incident management system to coordinate and direct fire response functions, including:
    - (i) Specific fire emergency responsibilities;
    - (ii) Accountability for all fire response employees participating in an emergency operation; and
    - (iii) Resources offered by outside organizations; and
  - (d) Provide the information required in this subsection to the outside fire response organization to be used.

(2007 Ed.)

(5) **Personal protective clothing and equipment for fire response employees.**

(a) **General requirements.** The employer must:

(i) Supply to all fire response employees, at no cost, the appropriate personal protective clothing and equipment they may need to perform expected duties; and

(ii) Ensure that fire response employees wear the appropriate personal protective clothing and use the equipment, when necessary, to protect them from hazardous exposures.

(b) **Thermal stability and flame resistance.** The employer must:

(i) Ensure that each fire response employee exposed to the hazards of flame does not wear clothing that could increase the extent of injury that could be sustained; and

(ii) Prohibit wearing clothing made from acetate, nylon, or polyester, either alone or in blends, unless it can be shown that:

(A) The fabric will withstand the flammability hazard that may be encountered; or

(B) The clothing will be worn in such a way to eliminate the flammability hazard that may be encountered.

(c) **Respiratory protection.** The employer must:

(i) Provide self-contained breathing apparatus (SCBA) to all fire response employees involved in an emergency operation in an atmosphere that is immediately dangerous to life or health (IDLH), potentially IDLH, or unknown;

(ii) Provide SCBA to fire response employees performing emergency operations during hazardous chemical emergencies that will expose them to known hazardous chemicals in vapor form or to unknown chemicals;

(iii) Provide fire response employees who perform or support emergency operations that will expose them to hazardous chemicals in liquid form either:

(A) SCBA; or

(B) Respiratory protective devices certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR Part 84 as suitable for the specific chemical environment;

(iv) Ensure that additional outside air supplies used in conjunction with SCBA result in positive pressure systems that are certified by NIOSH under 42 CFR Part 84;

(v) Provide only SCBA that meet the requirements of NFPA 1981-1997 Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service (incorporated by reference, see WAC 296-304-01003); and

(vi) Ensure that the respiratory protection program and all respiratory protection equipment comply with chapter 296-842 WAC, Respiratory protection.

(d) **Interior structural firefighting operations.** The employer must:

(i) Supply at no cost to all fire response employees exposed to the hazards of shipyard fire response, a helmet, gloves, footwear, and protective hoods, and either a protective coat and trousers or a protective coverall; and

(ii) Ensure that this equipment meets the applicable recommendations in NFPA 1971-2000 Standard on Protective Ensemble for Structural Fire Fighting (incorporated by reference, see WAC 296-304-01003).

(e) **Proximity fire fighting operations.** The employer must provide, at no cost, to all fire response employees who are exposed to the hazards of proximity fire fighting, appro-

ropriate protective proximity clothing that meets the applicable recommendations in NFPA 1976-2000 Standard on Protective Ensemble for Proximity Fire Fighting (incorporated by reference, see WAC 296-304-01003).

(f) **Personal alert safety system (PASS) devices.** The employer must:

(i) Provide each fire response employee involved in fire fighting operations with a PASS device; and

(ii) Ensure that each PASS device meets the recommendations in NFPA 1982-1998 Standard on Personal Alert Safety Systems (PASS) (incorporated by reference, see WAC 296-304-01003).

(g) **Life safety ropes, body harnesses, and hardware.** The employer must ensure that:

(i) All life safety ropes, body harnesses, and hardware used by fire response employees for emergency operations meet the applicable recommendations in NFPA 1983-2001, Standard on Fire Service Life Safety Rope and System Components (incorporated by reference, see WAC 296-304-01003);

(ii) Fire response employees use only Class I body harnesses to attach to ladders and aerial devices; and

(iii) Fire response employees use only Class II and Class III body harnesses for fall arrest and rappelling operations.

(6) **Equipment maintenance.**

(a) **Personal protective equipment.** The employer must inspect and maintain personal protective equipment used to protect fire response employees to ensure that it provides the intended protection.

(b) **Fire response equipment.** The employer must:

(i) Keep fire response equipment in a state of readiness;

(ii) Standardize all fire hose coupling and connection threads throughout the facility and on vessels and vessel sections by providing the same type of hose coupling and connection threads for hoses of the same or similar diameter; and

(iii) Ensure that either all fire hoses and coupling connection threads are the same within a facility or vessel or vessel section as those used by the outside fire response organization, or supply suitable adapter couplings if such an organization is expected to use the fire response equipment within a facility or vessel or vessel section.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01013, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-01015 Hazards of fixed extinguishing systems on board vessels and vessel sections.** (1) **Employer responsibilities.** The employer must comply with the provisions of this section whenever employees are exposed to fixed extinguishing systems that could create a dangerous atmosphere when activated in vessels and vessel sections, regardless of geographic location.

(2) **Requirements for automatic and manual systems.** Before any work is done in a space equipped with fixed extinguishing systems, the employer must either:

(a) Physically isolate the systems or use other positive means to prevent the systems' discharge; or

(b) Ensure employees are trained to recognize:

(i) Systems' discharge and evacuation alarms and the appropriate escape routes; and

(ii) Hazards associated with the extinguishing systems and agents including the dangers of disturbing system com-

ponents and equipment such as piping, cables, linkages, detection devices, activation devices, and alarm devices.

(3) **Sea and dock trials.** During trials, the employer must ensure that all systems shall remain operational.

(4) **Doors and hatches.** The employer must:

(a) Take protective measures to ensure that all doors, hatches, scuttles, and other exit openings remain working and accessible for escape in the event the systems are activated; and

(b) Ensure that all inward opening doors, hatches, scuttles, and other potential barriers to safe exit are removed, locked open, braced, or otherwise secured so that they remain open and accessible for escape if the systems' activation could result in a positive pressure in the protected spaces sufficient to impede escape.

(5) **Testing the system.**

(a) When testing a fixed extinguishing system involves a total discharge of extinguishing medium into a space, the employer must evacuate all employees from the space and assure that no employees remain in the space during the discharge. The employer must retest the atmosphere in accordance with WAC 296-304-02003 to ensure that the oxygen levels are safe for employees to enter.

(b) When testing a fixed extinguishing system does not involve a total discharge of the system's extinguishing medium, the employer must make sure that the system's extinguishing medium is physically isolated and that all employees not directly involved in the testing are evacuated from the protected space.

(6) **Conducting system maintenance.** Before conducting maintenance on a fixed extinguishing system, the employer must ensure that the system is physically isolated.

(7) **Using fixed manual extinguishing systems for fire protection.** If fixed manual extinguishing systems are used to provide fire protection for spaces in which the employees are working, the employer must ensure that:

(a) Only authorized employees are allowed to activate the system;

(b) Authorized employees are trained to operate and activate the systems; and

(c) All employees are evacuated from the protected spaces, and accounted for, before the fixed manual extinguishing system is activated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01015, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-01017 Land-side fire protection systems.** (1) **Employer responsibilities.** The employer must ensure all fixed and portable fire protection systems needed to meet WISHA standards for employee safety or employee protection from fire hazards in land-side facilities, including, but not limited to, buildings, structures, and equipment, meet the requirements of this section.

(2) **Portable fire extinguishers and hose systems.**

(a) The employer must select, install, inspect, maintain, and test all portable fire extinguishers according to NFPA 10-1998 Standard for Portable Fire Extinguishers (incorporated by reference, see WAC 296-304-01003).

(b) The employer is permitted to use Class II or Class III hose systems, in accordance with NFPA 10-1998, as portable fire extinguishers if the employer selects, installs, inspects,

maintains, and tests those systems according to the specific recommendations in NFPA 14-2000 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems (incorporated by reference, see WAC 296-304-01003).

(3) **General requirements for fixed extinguishing systems.** The employer must:

(a) Ensure that any fixed extinguishing system component or extinguishing agent is approved by an OSHA nationally recognized testing laboratory for use on the specific hazards the employer expects it to control or extinguish;

(b) Notify employees and take the necessary precautions to ensure employees are safe from fire if for any reason a fire extinguishing system stops working, until the system is working again;

(c) Ensure all repairs to fire extinguishing systems and equipment are done by a qualified technician or mechanic;

(d) Provide and ensure employees use proper personal protective equipment when entering discharge areas in which the atmosphere remains hazardous to employee safety or health, or provide safeguards to prevent employees from entering those areas. See WAC 296-304-02003 for additional requirements applicable to safe entry into spaces containing dangerous atmospheres;

(e) Post hazard warning or caution signs at both the entrance to and inside of areas protected by fixed extinguishing systems that use extinguishing agents in concentrations known to be hazardous to employee safety or health; and

(f) Select, install, inspect, maintain, and test all automatic fire detection systems and emergency alarms according to NFPA 72-1999 National Fire Alarm Code (incorporated by reference, see WAC 296-304-01003).

(4) **Fixed extinguishing systems.** The employer must select, install, maintain, inspect, and test all fixed systems required by WISHA as follows:

(a) Standpipe and hose systems according to NFPA 14-2000 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems (incorporated by reference, see WAC 296-304-01003);

(b) Automatic sprinkler systems according to NFPA 25-2002 Standard for the Inspection, Testing, and Maintenance of Water-based Fire Protection Systems, and either NFPA 13-1999 Standard for the Installation of Sprinkler Systems or NFPA 750-2000 Standard on Water Mist Fire Protection Systems (incorporated by reference, see WAC 296-304-01003);

(c) Fixed extinguishing systems that use water or foam as the extinguishing agent according to NFPA 15-2001 Standard for Water Spray Fixed Systems for Fire Protection; NFPA 11-1998 Standard for Low-Expansion Foam; and NFPA 11A-1999 Standard for Medium- and High-Expansion Foam Systems (incorporated by reference, see WAC 296-304-01003);

(d) Fixed extinguishing systems using dry chemical as the extinguishing agent according to NFPA 17-2002 Standard for Dry Chemical Extinguishing Systems (incorporated by reference, see WAC 296-304-01003); and

(e) Fixed extinguishing systems using gas as the extinguishing agent according to NFPA 12-2000 Standard on Carbon Dioxide Extinguishing Systems; NFPA 12A-1997 Standard on Halon 1301 Fire Extinguishing Systems; and NFPA 2001-2000 Standard on Clean Agent Fire Extinguishing Systems (incorporated by reference, see WAC 296-304-01003).

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01017, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-01019 Training.** (1) The employer must train employees in the applicable requirements of this section:

(a) By March 1, 2006, for employees currently working;

(b) Upon initial assignment for new employees; and

(c) When necessary to maintain proficiency for employees previously trained.

(2) **Employee training.** The employer must ensure that all employees are trained on:

(a) The emergency alarm signals, including system discharge alarms and employee evacuation alarms; and

(b) The primary and secondary evacuation routes that employees must use in the event of a fire in the workplace. While all vessels and vessel sections must have a primary evacuation route, a secondary evacuation route is not required when impracticable.

(3) **Additional training requirements for employees expected to fight incipient stage fires.** The employer must ensure that employees expected to fight incipient stage fires are trained on the following:

(a) The general principles of using fire extinguishers or hose lines, the hazards involved with incipient fire fighting, and the procedures used to reduce these hazards;

(b) The hazards associated with fixed and portable fire protection systems that employees may use or to which they may be exposed during discharge of those systems; and

(c) The activation and operation of fixed and portable fire protection systems that the employer expects employees to use in the workplace.

(4) **Additional training requirements for shipyard employees designated for fire response.** The employer must:

(a) Have a written training policy stating that fire response employees must be trained and capable of carrying out their duties and responsibilities at all times;

(b) Keep written standard operating procedures that address anticipated emergency operations and update these procedures as necessary;

(c) Review fire response employee training programs and hands-on sessions before they are used in fire response training to make sure that fire response employees are protected from hazards associated with fire response training;

(d) Provide training for fire response employees that ensures they are capable of carrying out their duties and responsibilities under the employer's standard operating procedures;

(e) Train new fire response employees before they engage in emergency operations;

(f) At least quarterly, provide training on the written operating procedures to fire response employees who are expected to fight fires;

(g) Use qualified instructors to conduct the training;

(h) Conduct any training that involves live fire response exercises in accordance with NFPA 1403-2002 Standard on Live Fire Training Evolutions (incorporated by reference, see WAC 296-304-01003);

(i) Conduct semiannual drills according to the employer's written procedures for fire response employees

that cover site-specific operations, occupancies, buildings, vessels and vessel sections, and fire-related hazards; and

(j) Prohibit the use of smoke generating devices that create a dangerous atmosphere in training exercises.

**(5) Additional training requirements for fire watch duty.**

(a) The employer must ensure that each fire watch is trained by an instructor with adequate fire watch knowledge and experience to cover the items as follows:

(i) Before being assigned to fire watch duty;

(ii) Whenever there is a change in operations that presents a new or different hazard;

(iii) Whenever the employer has reason to believe that the fire watch's knowledge, skills, or understanding of the training previously provided is inadequate; and

(iv) Annually.

(b) The employer must ensure that each employee who stands fire watch duty is trained in:

(i) The basics of fire behavior, the different classes of fire and of extinguishing agents, the stages of fire, and methods for extinguishing fires;

(ii) Extinguishing live fire scenarios whenever allowed by local and federal law;

(iii) The recognition of the adverse health effects that may be caused by exposure to fire;

(iv) The physical characteristics of the hot work area;

(v) The hazards associated with fire watch duties;

(vi) The personal protective equipment (PPE) needed to perform fire watch duties safely;

(vii) The use of PPE;

(viii) The selection and use of any fire extinguishers and fire hoses likely to be used by a fire watch in the work area;

(ix) The location and use of barriers;

(x) The means of communication designated by the employer for fire watches;

(xi) When and how to start fire alarm procedures; and

(xii) The employer's evacuation plan.

(c) The employer must ensure that each fire watch is trained to alert others to exit the space whenever:

(i) The fire watch perceives an unsafe condition;

(ii) The fire watch perceives that a worker performing hot work is in danger;

(iii) The employer or a representative of the employer orders an evacuation; or

(iv) An evacuation signal, such as an alarm, is activated.

**(6) Records.** The employer must keep records that demonstrate that employees have been trained as required by subsections (1) through (5) of this section.

(a) The employer must ensure that the records include the employee's name; the trainer's name; the type of training; and the date(s) on which the training took place.

(b) The employer must keep each training record for one year from the time it was made or until it is replaced with a new training record, whichever is shorter, and make it available for inspection and copying by WISHA on request.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-19-086, § 296-304-01019, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-01021 Competent person. (1) Application.** This section applies to shipyard employment.

[Title 296 WAC—p. 2282]

**(2) Designation.**

(a) One or more competent persons shall be designated by the employer in accordance with the applicable requirements of this section, unless the requirements of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011, are always carried out by a marine chemist.

**Exception:** The employer may designate any person who meets the applicable portions of the criteria set forth in subsection (3) of this section as a competent person who is limited to performing testing to the following situations:

(i) Repair work on small craft in boat yards where only combustible gas indicator tests are required for fuel tank leaks or when using flammable paints below decks;

(ii) Building of wooden vessels where only knowledge of the precautions to be taken when using flammable paints is required;

(iii) The breaking of vessels where there is no fuel oil or other flammable hazard; and

(iv) Tests and inspections performed to comply with WAC 296-304-03007 (2)(h) and 296-304-03009 (1)(e).

(b) The employer shall maintain either a roster of designated competent persons or a statement that a marine chemist will perform the tests or inspections which require a competent person.

(c) The employer shall make the roster of designated persons or the statement available to employees, the employee's representative, or the director upon request.

(d) The roster shall contain, as a minimum, the following:

(i) The employer's name;

(ii) The designated competent person's name(s); and

(iii) The date the employee was trained as a competent person.

**(3) Criteria.** The employer shall ensure that each designated competent person has the following skills and knowledge:

(a) Ability to understand and carry out written or oral information or instructions left by marine chemists, Coast Guard-authorized persons and certified industrial hygienists;

(b) Knowledge of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011;

(c) Knowledge of the structure, location, and designation of spaces where work is done;

(d) Ability to calibrate and use testing equipment including, but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;

(e) Ability to perform all required tests and inspections which are or may be performed by a competent person as set forth in WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011;

(f) Ability to inspect, test, and evaluate spaces to determine the need for further testing by a marine chemist or a certified industrial hygienist; and

(g) Ability to maintain records required by this section.

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**(4) Recordkeeping.**

(a) When tests and inspections are performed by a competent person, marine chemist, or certified industrial hygienist as required by any provisions of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, or WAC 296-304-080 through 296-304-08011, the employer shall ensure that the person performing the test and inspection records the location, time, date, location of inspected spaces, and the operations performed, as well as the test results and any instructions.

(b) The employer shall ensure that the records are posted in the immediate vicinity of the affected operations while work in the spaces is in progress. The records shall be kept on file for a period of at least three months from the completion date of the specific job for which they were generated.

(c) The employer shall ensure that the records are available for inspection by the director, and employees and their representatives.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-19-086, § 296-304-01021, filed 9/20/05, effective 12/1/05.]

**WAC 296-304-020 Confined and enclosed spaces and other dangerous atmospheres in shipyard employment.** Scope, application and definitions applicable to this subsection:

(1) Scope and application. This section applies to work in confined and enclosed spaces and other dangerous atmospheres in shipyard employment, including vessels, vessel sections, and on land-side operations regardless of geographic location.

(2) Definitions applicable to this section:

**Adjacent spaces** means those spaces bordering a subject space in all directions, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads.

**Certified industrial hygienist (CIH)** means an industrial hygienist who is certified by the American Board of Industrial Hygiene.

**Coast Guard authorized person** means an individual who meets the requirement of WAC 296-304-02015, Appendix B, for tank vessels, for passenger vessels, and for cargo and miscellaneous vessels.

**Dangerous atmosphere** means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (i.e., escape unaided from a confined or enclosed space), injury, or acute illness.

**Director** means the director of the department of labor and industries or his/her designated representative.

**Enter with restrictions** denotes a space where entry for work is permitted only if engineering controls, personal protective equipment, clothing, and time limitations are as specified by the marine chemist, certified industrial hygienist, or the shipyard competent person.

**Entry** means the action by which a person passes through an opening into a space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

**Hot work** means any activity involving riveting, welding, burning, the use of powder-actuated tools or similar fire-producing operations. Grinding, drilling, abrasive blasting, or

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similar spark-producing operations are also considered hot work except when such operations are isolated physically from any atmosphere containing more than 10 percent of the lower explosive limit of a flammable or combustible substance.

**Immediately dangerous to life or health (IDLH)** means an atmosphere that poses an immediate threat to life or that is likely to result in acute or immediate severe health effects.

**Inert or inerted atmosphere** means an atmospheric condition where:

(a) The oxygen content of the atmosphere in the space is maintained at a level equal to or less than 8.0 percent by volume or at a level at or below 50 percent of the amount required to support combustion, whichever is less; or

(b) The space is flooded with water and the vapor concentration of flammable or combustible materials in the free space atmosphere above the water line is less than 10 percent of the lower explosive limit for the flammable or combustible material.

**Labeled** means identified with a sign, placard, or other form of written communication, including pictograms, that provides information on the status or condition of the work space to which it is attached.

**Lower explosive limit (LEL)** means the minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source.

**Marine chemist** means an individual who possesses a current marine chemist certificate issued by the National Fire Protection Association (NFPA).

**NFPA** means National Fire Protection Association.

**Nationally Recognized Testing Laboratory (NRTL)** means an organization recognized by OSHA, in accordance with Appendix A of 29 CFR 1910.7, which tests for safety and lists or labels or accepts equipment and materials that meet all the criteria found in Section 1910.7(b)(1) through (b)(4)(ii).

**Not safe for hot work** denotes a space where hot work may not be performed because the conditions do not meet the criteria for "safe for hot work."

**Not safe for workers** denotes a space where an employee may not enter because the conditions do not meet the criteria for "safe for workers."

**Oxygen-deficient atmosphere** means an atmosphere having an oxygen concentration of less than 19.5 percent by volume.

**Oxygen-enriched atmosphere** means an atmosphere that contains 22.0 percent or more oxygen by volume.

**Safe for hot work** denotes a space that meets all of the following criteria:

(a) The oxygen content of the atmosphere does not exceed 22.0 percent by volume;

(b) The concentration of flammable vapors in the atmosphere is less than 10 percent of the lower explosive limit;

(c) The residues or materials in the space are not capable of producing a higher concentration than permitted in (a) or (b) of the above, under existing atmospheric conditions in the presence of hot work and while maintained as directed by the marine chemist or competent person; and

(d) All adjacent spaces have been cleaned, or inerted, or treated sufficiently to prevent the spread of fire.

**Safe for workers** denotes a space that meets the following criteria:

- (a) The oxygen content of the atmosphere is at least 19.5 percent and below 22.0 percent by volume;
- (b) The concentration of flammable vapors is below 10 percent of the lower explosive limit (LEL);
- (c) Any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, or inerting media are within permissible concentrations at the time of the inspection; and
- (d) Any residues or materials associated with the work authorized by the marine chemist, certified industrial hygienist, or competent person will not produce uncontrolled release of toxic materials under existing atmospheric conditions while maintained as directed.

**Space** means an area on a vessel or vessel section or within a shipyard such as, but not limited to: Cargo tanks or holds; pump or engine rooms; storage lockers; tanks containing flammable or combustible liquids, gases, or solids; rooms within buildings; crawl spaces; tunnels; or accessways. The atmosphere within a space is the entire area within its bounds.

**Upper explosive limit (UEL)** means the maximum concentration of flammable vapor in air above which propagation of flame does not occur on contact with a source of ignition.

**Vessel section** means a subassembly, module, or other component of a vessel being built, repaired, or broken.

**Visual inspection** means the physical survey of the space, its surroundings and contents to identify hazards such as, but not limited to, restricted accessibility, residues, unguarded machinery, and piping or electrical systems.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-020, filed 1/18/95, effective 3/10/95; 93-04-111 (Order 92-15), § 296-304-020, filed 2/3/93, effective 3/15/93; Order 74-25, § 296-304-020, filed 5/7/74.]

#### **WAC 296-304-02001 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02001, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02001, filed 3/1/76; Order 74-25, § 296-304-02001, filed 5/7/74.]

**WAC 296-304-02003 Precautions and the order of testing before entering confined and enclosed spaces and other dangerous atmospheres.** The employer shall ensure that atmospheric testing is performed in the following sequence: Oxygen content, flammability, toxicity.

- (1) Oxygen content.
  - (a) The employer shall ensure that the following spaces are visually inspected and tested by a competent person to determine the atmosphere's oxygen content prior to initial entry into the space by an employee:
    - (i) Spaces that have been sealed, such as, but not limited to, spaces that have been coated and closed up, and nonventilated spaces that have been freshly painted;
    - (ii) Spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases;
    - (iii) Spaces and adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive, or irritant;
    - (iv) Spaces and adjacent spaces that have been fumigated; and
    - (v) Spaces containing materials or residues of materials that create an oxygen-deficient atmosphere.

(b) If the space to be entered contains an oxygen deficient atmosphere, the space shall be labeled "not safe for workers" or, if oxygen-enriched, "not safe for workers—not safe for hot work." If an oxygen-deficient or oxygen-enriched atmosphere is found, ventilation shall be provided at volumes and flow rates sufficient to ensure that the oxygen content is maintained at or above 19.5 percent and below 22.0 percent by volume. The warning label may be removed when the oxygen content is equal to or greater than 19.5 and less than 22.0 percent by volume.

(c) An employee may not enter a space where the oxygen content, by volume, is below 19.5 percent or above 22.0 percent.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space provided:

- (i) The atmosphere in the space is monitored for oxygen content, by volume, continuously; and
- (ii) Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note to (a): Other provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-09007.

#### (2) Flammable atmospheres.

(a) The employer shall ensure that spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases are:

- (i) Inspected visually by the competent person to determine the presence of combustible or flammable liquids; and
- (ii) Tested by a competent person prior to entry by an employee to determine the concentration of flammable vapors and gases within the space.

(b) If the concentration of flammable vapors or gases in the space to be entered is equal to or greater than 10 percent of the lower explosive limit, the space shall be labeled "not safe for workers" and "not safe for hot work." Ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapors is maintained below 10 percent of the lower explosive limit. The warning labels may be removed when the concentration of flammable vapors is below 10 percent of the lower explosive limit.

(c) An employee may not enter a space where the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space, provided:

- (i) No ignition sources are present;
- (ii) The atmosphere in the space is monitored continuously;
- (iii) Atmospheres at or above the upper explosive limit are maintained; and
- (iv) Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note 1 to (2): Additional provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-09007.

Note 2 to (2): Additional provisions for work in spaces containing a flammable substance which also has a permissible exposure limit, are located in subsection (3) of this section and chapter 296-841 WAC.

(3) Toxic, corrosive, irritant or fumigated atmospheres and residues.

(a) The employer shall ensure that spaces or adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive or irritant are:

(i) Inspected visually by the competent person to determine the presence of toxic, corrosive, or irritant residue contaminants; and

(ii) Tested by a competent person prior to initial entry by an employee to determine the air concentration of toxics, corrosives, or irritants within the space.

(b) If a space contains an air concentration of a material which exceeds a chapter 296-841 WAC, permissible exposure limit (PEL) or is IDLH, the space shall be labeled "not safe for workers." Ventilation shall be provided at volumes and flow rates which will ensure that air concentrations are maintained within the PEL or, in the case of contaminants for which there is no established PEL, below the IDLH. The warning label may be removed when the concentration of contaminants is maintained within the PEL or below IDLH level.

(c) If a space cannot be ventilated to within the PELs or is IDLH, a marine chemist or CIH must retest until the space can be certified "enter with restrictions" or "safe for workers."

(d) An employee may not enter a space whose atmosphere exceeds a PEL or is IDLH.

Exception: An employee may enter for emergency rescue, or for a short duration for installation of ventilation equipment provided:

(i) The atmosphere in the space is monitored continuously;

(ii) Respiratory protection and other necessary and appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note to (3): Other provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-9007.

(4) Training of employees entering confined and enclosed spaces or other dangerous atmospheres.

(a) The employer shall ensure that each employee that enters a confined or enclosed space and other areas with dangerous atmospheres is trained to perform all required duties safely.

(b) The employer shall ensure that each employee who enters a confined space, enclosed space, or other areas with dangerous atmospheres is trained to:

(i) Recognize the characteristics of the confined space;

(ii) Anticipate and be aware of the hazards that may be faced during entry;

(iii) Recognize the adverse health effects that may be caused by the exposure to a hazard;

(iv) Understand the physical signs and reactions related to exposures to such hazards;

(v) Know what personal protective equipment is needed for safe entry into and exit from the space;

(vi) Use personal protective equipment; and

(vii) Where necessary, be aware of the presence and proper use of barriers that may be needed to protect an entrant from hazards.

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(c) The employer shall ensure that each entrant into confined or enclosed spaces or other dangerous atmospheres is trained to exit the space or dangerous atmosphere whenever:

(i) The employer or his or her representative orders evacuation;

(ii) An evacuation signal such as an alarm is activated; or

(iii) The entrant perceives that he or she is in danger.

(d) The employer shall provide each employee with training:

(i) Before the entrant begins work addressed by this chapter; and

(ii) Whenever there is a change in operations or in an employee's duties that presents a hazard about which the employee has not previously been trained.

(e) The employer shall certify that the training required by (a) through (d) of this subsection has been accomplished.

(i) The certification shall contain the employee's name, the name of the certifier, and the date(s) of the certification.

(ii) The certification shall be available for inspection by the director, employees, and their representatives.

(5) Rescue teams. The employer shall either establish a shipyard rescue team or arrange for an outside rescue team which will respond promptly to a request for rescue service.

(a) Shipyard rescue teams shall meet the following criteria:

(i) Each employee assigned to the shipyard team shall be provided with and trained to use the personal protective equipment he or she will need, including respirators and any rescue equipment necessary for making rescues from confined and enclosed spaces and other dangerous atmospheres.

(ii) Each employee assigned to the shipyard rescue team shall be trained to perform his or her rescue functions including confined and enclosed and other dangerous atmosphere entry.

(iii) Shipyard rescue teams shall practice their skills at least once every 12 months. Practice drills shall include the use of mannequins and rescue equipment during simulated rescue operations involving physical facilities that approximate closely those facilities from which rescue may be needed.

Note to (5)(a)(iii): If the team performs an actual rescue during the 12 month period, an additional practice drill for that type of rescue is not required.

(iv) At least one person on each rescue team shall maintain current certification in basic first aid which includes maintenance of an airway, control of bleeding, maintenance of circulation and cardiopulmonary resuscitation (CPR) skills.

(b) The employer shall inform outside rescue teams of the hazards that the team may encounter when called to perform confined and enclosed space or other dangerous atmosphere rescue at the employer's facility so that the rescue team can be trained and equipped.

Note to (5): The criteria for in-house rescue, listed in (5)(a) can be used by the employer in evaluating outside rescue services.

(6) Exchanging hazard information between employers. Each employer whose employees work in confined and enclosed spaces or other dangerous atmospheres shall ensure that all available information on the hazards, safety rules, and

emergency procedures concerning those spaces and atmospheres is exchanged with any other employer whose employees may enter the same spaces.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-304-02003, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060, 95-22-015, § 296-304-02003, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW, 95-04-006, § 296-304-02003, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-02003, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-02003, filed 3/1/76; Order 74-25, § 296-304-02003, filed 5/7/74.]

**WAC 296-304-02005 Cleaning and other cold work.**

(1) Locations covered by this section. The employer shall ensure that manual cleaning and other cold work are not performed in the following spaces unless the conditions of subsection (2) of this section have been met:

(a) Spaces containing or having last contained bulk quantities of combustible or flammable liquids or gases; and

(b) Spaces containing or having last contained bulk quantities of liquids, gases or solids that are toxic, corrosive or irritating.

(2) Requirements for performing cleaning or cold work.

(a) Liquid residues of hazardous materials shall be removed from work spaces as thoroughly as practicable before employees start cleaning operations or cold work in a space. Special care shall be taken to prevent the spilling or the draining of these materials into the water surrounding the vessel, or for shore-side operations, onto the surrounding work area.

(b) Testing shall be conducted by a competent person to determine the concentration of flammable, combustible, toxic, corrosive, or irritant vapors within the space prior to the beginning of cleaning or cold work.

(c) Continuous ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration(s) of:

(i) Flammable vapor is maintained below 10 percent of the lower explosive limit; and

Note to (2)(c)(i): Spaces containing highly volatile residues may require additional ventilation to keep the concentration of flammable vapors below 10 percent of the lower explosive limit and within the permissible exposure limit.

(ii) Toxic, corrosive, or irritant vapors are maintained within the permissible exposure limits and below IDLH levels.

(d) Testing shall be conducted by the competent person as often as necessary during cleaning or cold work to assure that air concentrations are below 10 percent of the lower explosive limit and within the PELs and below IDLH levels. Factors such as, but not limited to, temperature, volatility of the residues and other existing conditions in and about the spaces are to be considered in determining the frequency of testing necessary to assure a safe atmosphere.

Note to (2)(d): See WAC 296-304-02013—Appendix A, for additional information on frequency of testing.

(e) Spills or other releases of flammable, combustible, toxic, corrosive, and irritant materials shall be cleaned up as work progresses.

(f) An employee may not enter a confined or enclosed space or other dangerous atmosphere if the concentration of

flammable or combustible vapors in work spaces exceeds 10 percent of the lower explosive limit.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment provided:

(i) No ignition sources are present;

(ii) The atmosphere in the space is monitored continuously;

(iii) The atmosphere in the space is maintained above the upper explosive limit; and

(iv) Respiratory protection, personal protective equipment, and clothing are provided in accordance with WAC 206-304-090 through 296-304-09007.

Note to (2)(f): Other provisions for work in IDLH and other dangerous atmospheres are located in WAC 296-304-090 through 296-304-09007.

(g) A competent person shall test ventilation discharge areas and other areas where discharged vapors may collect to determine if vapors discharged from the spaces being ventilated are accumulating in concentrations hazardous to employees.

(h) If the tests required in (g) of this subsection indicate that concentrations of exhaust vapors that are hazardous to employees are accumulating, all work in the contaminated area shall be stopped until the vapors have dissipated or been removed.

(i) Only explosion-proof, self-contained portable lamps, or other electric equipment approved by a National Recognized Testing Laboratory (NRTL) for the hazardous location shall be used in spaces described in subsection (1) of this section, until such spaces have been certified as "safe for workers."

Note to (2)(i): Battery-fed, portable lamps or other electric equipment bearing the approval of a NRTL for the class, and division of the location in which they are used are deemed to meet the requirements of (i) of this subsection.

(j) The employer shall prominently post signs that prohibit sources of ignition within or near a space that has contained flammable or combustible liquids or gases in bulk quantities:

(i) At the entrance to those spaces;

(ii) In adjacent spaces; and

(iii) In the open area adjacent to those spaces.

(k) All air moving equipment and its component parts, including duct work, capable of generating a static electric discharge of sufficient energy to create a source of ignition, shall be bonded electrically to the structure of a vessel or vessel section or, in the case of land-side spaces, grounded to prevent an electric discharge in the space.

(l) Fans shall have nonsparking blades, and portable air ducts shall be of nonsparking materials.

Note to (2): See WAC 296-304-02003(3) and applicable requirements of chapter 296-62 WAC, general occupational health standards, for other provisions affecting cleaning and cold work.

[Statutory Authority: Chapter 49.17 RCW, 95-04-006, § 296-304-02005, filed 1/18/95, effective 3/10/95; Order 74-25, § 296-304-02005, filed 5/7/74.]

**WAC 296-304-02007 Hot work.** (1) Hot work requiring testing by a marine chemist or Coast Guard authorized person.

(a) The employer shall ensure that hot work is not performed in or on any of the following confined and enclosed spaces and other dangerous atmospheres, boundaries of spaces or pipelines until the work area has been tested and certified by a marine chemist or a U.S. Coast Guard authorized person as "safe for hot work":

(i) Within, on, or immediately adjacent to spaces that contain or have contained combustible or flammable liquids or gases.

(ii) Within, on, or immediately adjacent to fuel tanks that contain or have last contained fuel; and

(iii) On pipelines, heating coils, pump fittings or other accessories connected to spaces that contain or have last contained fuel.

(iv) Exception: On dry cargo, miscellaneous and passenger vessels and in the landside operations within spaces which meet the standards for oxygen, flammability and toxicity in WAC 296-304-02003, but are adjacent to spaces containing flammable gases or liquids, as long as the gases or liquids with a flash point below 150 deg. F (65.6 deg. C) when the distance between such spaces and the work is 25 feet (7.62 m) or greater.

Note: For flammable liquids with flash points above 150 deg. F (65.6 deg. C), see subsection (2) of this section.

Note to (1)(a): The criteria for "safe for hot work" is located in the definition section, WAC 296-304-020(2).

(b) The certificate issued by the marine chemist or Coast Guard authorized person shall be posted in the immediate vicinity of the affected operations while they are in progress and kept on file for a period of at least three months from the date of the completion of the operation for which the certificate was generated.

(2) Hot work requiring testing by a competent person.

(a) Hot work is not permitted in or on the following spaces or adjacent spaces or other dangerous atmospheres until they have been tested by a competent person and determined to contain no concentrations of flammable vapors equal to or greater than 10 percent of the lower explosive limit:

(i) Dry cargo holds;

(ii) The bilges;

(iii) The engine room and boiler spaces for which a marine chemist or a Coast Guard authorized person certificate is not required under subsection (1)(a)(i) of this section; and

(iv) Vessels and vessel sections for which a marine chemist or Coast Guard authorized person certificate is not required under subsection (1)(a)(i) of this section; and

(v) Land-side confined and enclosed spaces or other dangerous atmospheres not covered by subsection (1)(a) of this section.

(b) If the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit in the space or an adjacent space where the hot work is to be done, then the space shall be labeled "not safe for hot work" and ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapors or gases is below 10 percent by volume of the lower

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explosive limit. The warning label may be removed when the concentration of flammable vapors and gases are below 10 percent of the lower explosive limit.

Note to WAC  
296-304-02007:

See WAC 296-304-02013—Appendix A, for additional information relevant to performing hot work safely.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-02007, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02007, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02007, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02007, filed 3/1/76; Order 74-25, § 296-304-02007, filed 5/7/74.]

#### **WAC 296-304-02009 Maintenance of safe conditions.**

(1) Preventing hazardous materials from entering. Pipelines that could carry hazardous materials into spaces that have been certified "safe for workers" or "safe for hot work" shall be disconnected, blanked off, or otherwise blocked by a positive method to prevent hazardous materials from being discharged into the space.

(2) Alteration of existing conditions. When a change that could alter conditions within a tested confined or enclosed space or other dangerous atmosphere occurs, work in the affected space or area shall be stopped. Work may not be resumed until the affected space or area is visually inspected and retested and found to comply with WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable.

Note to (2): Examples of changes that would warrant the stoppage of work include: The opening of manholes or other closures or the adjusting of a valve regulating the flow of hazardous materials.

(3) Tests to maintain the conditions of a marine chemist's or Coast Guard authorized person's certificates. A competent person shall visually inspect and test each space certified as "safe for workers" or "safe for hot work," as often as necessary to ensure that atmospheric conditions within that space are maintained within the conditions established by the certificate after the certificate has been issued.

(4) Change in the conditions of a marine chemist's or Coast Guard authorized person's certificate. If a competent person finds that the atmospheric conditions within a certified space fail to meet the applicable requirements of WAC 296-304-02003, 296-304-02005, and 296-304-02007, work in the certified space shall be stopped and may not be resumed until the space has been retested by a marine chemist or Coast Guard authorized person and a new certificate issued in accordance with WAC 296-304-02007(1).

(5) Tests to maintain a competent person's findings. After a competent person has conducted a visual inspection and tests required in WAC 296-304-02003, 296-304-02005, and 296-304-02007 and determined a space to be safe for an employee to enter, he or she shall continue to test and visually inspect spaces as often as necessary to ensure that the required atmospheric conditions within the tested space are maintained.

(6) Changes in conditions determined by competent person's findings. After the competent person has determined initially that a space is safe for an employee to enter and he or she finds subsequently that the conditions within the tested space fail to meet the requirements of WAC 296-304-02003,

296-304-02005, and 296-304-02007, as applicable, work shall be stopped until the conditions in the tested space are corrected to comply with WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-02009, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02009, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02009, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02009, filed 3/1/76; Order 74-25, § 296-304-02009, filed 5/7/74.]

**WAC 296-304-02011 Warning signs and labels. (1)**

Employee comprehension of signs and labels. The employer shall ensure that each sign or label posted to comply with the requirements of this section is presented in a manner that can be perceived and understood by all employees.

(2) Posting of large work areas. A warning sign or label required by subsection (1) of this section need not be posted at an individual tank, compartment or work space within a work area if the entire work area has been tested and certified: "Not safe for workers," "not safe for hot work," and if the sign or label to this effect is posted conspicuously at each means of access to the work area.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02011, filed 1/18/95, effective 3/10/95; Order 74-25, § 296-304-02011, filed 5/7/74.]

**WAC 296-304-02013 Appendix A—Compliance assistance guidelines for confined and enclosed spaces and other dangerous atmospheres.** This appendix is a non-mandatory set of guidelines provided to assist employers in complying with the requirements of WAC 296-304-020 through 296-304-02011. This appendix neither creates additional obligations nor detracts from obligations otherwise contained in this chapter. It is intended to provide explanatory information and educational material to employers and employees to foster understanding of, and compliance with, this chapter.

WAC 296-304-020 through 296-304-02011. These standards are minimum safety standards for entering and working safely in vessel tanks and compartments.

WAC 296-304-020(2) Definition of "Hot work." There are several instances in which circumstances do not necessitate that grinding, drilling, abrasive blasting be regarded as hot work. Some examples are:

(1) Abrasive blasting of the hull for paint preparation does not necessitate pumping and cleaning the tanks of a vessel.

(2) Prior to hot work on any hollow structure, the void space should be tested and appropriate precautions taken.

WAC 296-304-020(2) Definition of "Lower explosive limit." The terms lower flammable limit (LFL) and lower explosive limit (LEL) are used interchangeably in fire science literature.

WAC 296-304-020(2) Definition of "Upper explosive limit." The terms upper flammable limit (UFL) and upper explosive limit (UEL) are used interchangeably in fire science literature.

WAC 296-304-02003(1) After a tank has been properly washed and ventilated, the tank should contain 20.8 percent oxygen by volume. This is the same amount found in our nor-

mal atmosphere at sea level. However, it is possible that the oxygen content will be lower. When this is the case, the reasons for this deficiency should be determined and corrective action taken.

An oxygen content of 19.5 percent can support life and is adequate for entry. However, any oxygen level less than 20.8 percent and greater than 19.5 percent level should also alert the competent person to look for the causes of the oxygen deficiency and to correct them prior to entry.

WAC 296-304-02003(2) Flammable atmospheres. Atmospheres with a concentration of flammable vapors at or above 10 percent of the lower explosive limit (LEL) are considered hazardous when located in confined spaces. However, atmospheres with flammable vapors below 10 percent of the LEL are not necessarily safe.

Such atmospheres are too lean to burn. Nevertheless, when a space contains or produces measurable flammable vapors below the 10 percent LEL, it might indicate that flammable vapors are being released or introduced into the space and could present a hazard in time. Therefore, the cause of the vapors should be investigated and, if possible, eliminated prior to entry.

Some situations that have produced measurable concentrations of flammable vapors that could exceed 10 percent of the LEL in time are:

(1) Pipelines that should have been blanked or disconnected have opened, allowing product into the space.

(2) The vessel may have shifted, allowing product not previously cleaned and removed during washing to move into other areas of the vessel.

(3) Residues may be producing the atmosphere by releasing flammable vapor.

WAC 296-304-02003(2) Flammable atmospheres that are toxic. An atmosphere with a measurable concentration of a flammable substance below 10 percent of the LEL may be above the WISHA permissible exposure limit for that substance. In that case, refer to WAC 296-304-02003 (3)(b), (c), and (d).

WAC 296-304-02005 (2)(d), 296-304-02009(3), and 296-304-02009(5). The frequency with which a tank is monitored to determine if atmospheric conditions are being maintained is a function of several factors that are discussed below:

(1) Temperature. Higher temperatures will cause a combustible or flammable liquid to vaporize at a faster rate than lower temperatures. This is important since hotter days may cause tank residues to produce more vapors and that may result in the vapors exceeding 10 percent of the LEL or an overexposure to toxic contaminants.

(2) Work in the tank. Any activity in the tank could change the atmospheric conditions in that tank. Oxygen from a leaking oxyfuel hose or torch could result in an oxygen-enriched atmosphere that would more easily propagate a flame. Some welding operations use inert gas, and leaks can result in an oxygen-deficient atmosphere. Manual tank cleaning with high pressure spray devices can stir up residues and result in exposures to toxic contaminants. Simple cleaning or mucking out, where employees walk through and shovel residues and sludge, can create a change in atmospheric conditions.

(3) Period of time elapsed. If a period of time has elapsed since a marine chemist or Coast Guard authorized person has certified a tank as safe, the atmospheric condition should be rechecked by the competent person prior to entry and starting work.

(4) Unattended tanks or spaces. When a tank or space has been tested and declared safe, then subsequently left unattended for a period of time, it should be retested prior to entry and starting work. For example, when barges are left unattended at night, unidentified products from another barge are sometimes dumped into their empty tanks. Since this would result in a changed atmosphere, the tanks should be retested prior to entry and starting work.

(5) Work break. When workers take a break or leave at the end of the shift, equipment sometimes is inadvertently left in the tanks. At lunch or work breaks and at the end of the shift are the times when it is most likely someone will leave a burning or cutting torch in the tank, perhaps turned on and leaking oxygen or an inert gas. Since the former can produce an oxygen-enriched atmosphere, and the latter an oxygen-deficient atmosphere, tanks should be checked for equipment left behind, and atmosphere, monitored if necessary prior to reentering and resuming work. In an oxygen-enriched atmosphere, the flammable range is severely broadened. This means that an oxygen-enriched atmosphere can promote very rapid burning.

(6) Ballasting or trimming. Changing the position of the ballast, or trimming or in any way moving the vessel so as to expose cargo that had been previously trapped, can produce a change in the atmosphere of the tank. The atmosphere should be retested after any such move and prior to entry or work.

WAC 296-304-02007 (1) and (2) hot work. This is a reminder that other sections of the WISHA shipyard safety and health standards in chapter 296-304 WAC should be reviewed prior to starting any hot work. Most notably, WAC 296-304-040 through 296-304-04013, welding, cutting and heating, places additional restrictions on hot work: The requirements of WAC 296-304-04001 and 296-304-04005 must be met before hot work is begun on any metal that is toxic or is covered by a preservative coating respectively; the requirements of WAC 296-304-04007 must be met before welding, cutting, or heating is begun on any structural voids.

WAC 296-304-02003 (1)(b). During hot work, more than 20.8 percent oxygen by volume can be unsafe since it extends the normal flammable range. The standard permits the oxygen level to reach 22.0 percent by volume in order to account for instrument error. However, the cause of excess oxygen should be investigated and the source removed.

WAC 296-304-02011(2). If the entire vessel has been found to be in the same condition, then employers shall be considered to be in compliance with this requirement when signs using appropriate warning language in accordance with WAC 296-304-02011(1) are posted at the gangway and at all other means of access to the vessel.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02013, filed 1/18/95, effective 3/10/95.]

**WAC 296-304-02015 Appendix B—Confined and enclosed spaces and other dangerous atmospheres in shipyard employment.** This appendix provides a complete reprint of U.S. Coast Guard regulations as of October 1, 1993

(2007 Ed.)

referenced in WAC 296-304-020 for purposes of determining who is a Coast Guard authorized person.

(1) Title 46 CFR 35.01-1 (a) through (c) covering hot work on tank vessels reads as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks that have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or

(ii) Within or on the boundaries of fuel tanks; or

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions, the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemists are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified, throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) Title 46 CFR 71.60(c)(1) covering hot work on passenger vessels reads as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or

(ii) Within or on the boundaries of fuel tanks; or  
 (iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicated that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(3) Title 46 CFR 91.50-1(c)(1) covering hot work on cargo and miscellaneous vessels as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or,

(ii) Within or on the boundaries of fuel tanks; or,

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicated that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by

the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02015, filed 1/18/95, effective 3/10/95.]

**WAC 296-304-030 Surface preparation and preservation—Scope and application.** All sections of this chapter which include WAC 296-304-030 in the section number apply to surface preparation and preservation and WAC 296-304-03001 to 296-304-03009 applies only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-030, filed 5/7/74.]

**WAC 296-304-03001 Toxic cleaning solvents.** (1) When toxic solvents are used, the employer shall employ one or more of the following measures to safeguard the health of employees exposed to these solvents.

(a) The cleaning operation shall be completely enclosed to prevent the escape of vapor into the working space.

(b) Either natural ventilation or mechanical exhaust ventilation shall be used to remove the vapor at the source and to dilute the concentration of vapors in the working space to a concentration which is safe for the entire work period.

(c) The employer must ensure that employees are protected against:

- Toxic vapors by suitable respiratory protective equipment that meets the requirements of chapter 296-842 WAC; and

- Exposure of skin and eyes to contact with toxic solvents and their vapors by suitable clothing and equipment.

(2) The principles in the threshold limit values to which attention is directed in WAC 296-304-02005 and applicable sections in chapters 296-62 and 296-841 WAC will be used by the department of labor and industries in enforcement proceedings in defining a safe concentration of air contaminants.

(3) When flammable solvents are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-304-03001, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-03001, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-03001, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03001, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03001, filed 3/1/76; Order 74-25, § 296-304-03001, filed 5/7/74.]

**WAC 296-304-03003 Chemical paint and preservative removers.** (1) The employer must ensure that employees are protected against:

- Skin contact during the handling and application of chemical paint and preservative removers; and

- Eye injury by goggles or face shields that meet the requirements of WAC 296-304-09005 (1) and (2).

(2) When using flammable paint and preservative removers precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

(3) When using chemical paint and preservative removers which contain volatile and toxic solvents, such as benzol, acetone and amyl acetate, the provisions of WAC 296-304-03001 shall be applicable.

(4) The employer must ensure that employees using paint and rust removers containing strong acids or alkalies are protected by suitable face shields to prevent chemical burns on the face and neck according to the requirements of WAC 296-304-09005 (1) and (2).

(5) The employer must ensure that all employees working within range of a steam gun blast are protected by suitable face shields according to the requirements of WAC 296-304-09005 (1) and (2). Metal parts of the steam gun itself must be insulated to protect the operator against heat burns.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-03003, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-03003, filed 5/7/74.]

#### **WAC 296-304-03005 Mechanical paint removers. (1)**

Power tools.

(a) The employer must ensure that employees engaged in the removal of paints, preservatives, rusts or other coatings by means of power tools are protected against eye injury by goggles or face shields that meets the requirements of WAC 296-304-09005 (1) and (2).

(b) All portable rotating tools used for the removal of paints, preservatives, rusts or other coatings shall be adequately guarded to protect both the operator and nearby workers from flying missiles.

(c) Portable electric tools shall be grounded in accordance with the requirements of WAC 296-304-08003 (1) and (2).

(d) In a confined space, the employer must provide mechanical exhaust ventilation sufficient to keep the dust concentration to a minimum, or must protect employees by respiratory protective equipment that meets the requirements of chapter 296-842 WAC.

(2) Flame removal.

(a) The employer must ensure that when hardened preservative coatings are removed by flame in enclosed spaces, the employees exposed to fumes are protected by air line respirators that meet the requirements of chapter 296-842 WAC. Employees performing this operation in the open air, and those exposed to the resulting fumes, must be protected by a fume filter respirator that meets the requirements of chapter 296-842 WAC.

(b) Flame or heat shall not be used to remove soft and greasy preservative coatings.

(3) Abrasive blasting.

(a) Equipment. Hoses and fittings used for abrasive blasting shall meet the following requirements:

(i) Hoses. Hose of a type to prevent shocks from static electricity shall be used.

(ii) Hose couplings. Hose lengths shall be joined by metal couplings secured to the outside of the hose to avoid erosion and weakening of the couplings.

(ii) Nozzles. Nozzles shall be attached to the hose by fittings that will prevent the nozzle from unintentionally becoming disengaged. Nozzle attachments shall be of metal and shall fit onto the hose externally.

(iv) Dead man control. A dead man control device shall be provided at the nozzle end of the blasting hose either to provide direct cutoff or to signal the pot tender by means of a visual and audible signal to cut off the flow, in the event the blaster loses control of the hose. The pot tender shall be available at all times to respond immediately to the signal.

(b) Replacement. Hoses and all fittings used for abrasive blasting shall be inspected frequently to insure timely replacement before an unsafe amount of wear has occurred.

(c) Personal protective equipment.

(i) The employer must ensure that abrasive blasters working in enclosed spaces are protected by abrasive blasting respirators that meet the requirements of chapter 296-818 WAC, Abrasive blasting and chapter 296-842 WAC.

(ii) The employer must ensure that abrasive blasters working in the open are protected as required in subsection (1) of this section.

Exception: When synthetic abrasives containing less than one percent free silica are used, the employer may substitute particulate or dust filter respirators that are approved by the National Institute of Safety and Health (NIOSH) and used according to chapter 296-842 WAC.

(ii) The employer must ensure that employees, including machine tenders and abrasive recovery workers, working in areas where unsafe concentrations of abrasive materials and dusts are present are protected by eye and respiratory protective equipment that meets the requirements of WAC 296-304-09005 (1) and (2) and chapter 296-842 WAC.

Exception: This requirement does not apply to blasters.

(iv) The employer must ensure that a blaster is protected against injury from exposure to the blast by appropriate protective clothing, including gloves that meet the requirements of WAC 296-304-09015(1).

(v) A surge from a drop in pressure in the hose line can throw a blaster off the staging. To protect against this hazard, the employer must ensure that a blaster is protected by a personal fall arrest system, that meets the requirements of WAC 296-304-09021. The personal fall arrest system must be tied off to the ship or other structure during blasting from elevations where adequate fall protection cannot be provided by railings.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-304-03005, filed 6/6/06, effective 9/1/06; 05-03-093, § 296-304-03005, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-10-071, § 296-304-03005, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-03005, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-03005, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03005, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03005, filed 3/1/76; Order 74-25, § 296-304-03005, filed 5/7/74.]

**WAC 296-304-03007 Painting.** All respirators required by this section must meet the requirements of chapter 296-842 WAC.

(1) Paints mixed with toxic vehicles or solvents.

(a) When employees spray paints mixed with toxic vehicles or solvents, the employer must ensure that the following conditions are met:

(i) In confined spaces, employees continuously exposed to spraying are protected by air line respirators.

(ii) In tanks or compartments, employees continuously exposed to spraying are protected by air line respirators. Where mechanical ventilation is provided, employees are protected by respirators.

(iii) In large and well ventilated areas, employees exposed to spraying are protected by respirators.

(b) The employer must ensure that where employees apply by brush paints with toxic solvents in confined spaces or other areas where lack of ventilation creates a hazard, the employees are protected by filter respirators.

(c) When flammable paints or vehicles are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

(d) The metallic parts of air moving devices, including fans, blowers, and jet-type air movers, and all duct work shall be electrically bonded to the vessel's structure.

(2) Paints and tank coatings dissolved in highly volatile, toxic and flammable solvents. Several organic coatings, adhesives and resins are dissolved in highly toxic, flammable and explosive solvents with flash points below 80°F. Work involving such materials shall be done only when all of the following special precautions have been taken:

(a) Sufficient exhaust ventilation shall be provided to keep the concentration of solvent vapors below ten percent of the lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.

(b) If the ventilation fails or if the concentration of solvent vapors reaches or exceeds ten percent of the lower explosive limit, painting shall be stopped and the compartment shall be evacuated until the concentration again falls below ten percent of the lower explosive limit. If the concentration does not fall when painting is stopped, additional ventilation to bring the concentration down to ten percent of the lower explosive limit shall be provided.

(c) Ventilation shall be continued after the completion of painting until the space or compartment is gas free. The final determination as to whether the space or compartment is gas free shall be made after the ventilating equipment has been shut off for a least ten minutes.

(d) Exhaust ducts shall discharge clear of working areas and away from sources of possible ignition. Periodic tests shall be made to ensure that the exhausted vapors are not accumulating in other areas within or around the vessel or dry dock.

(e) All motors and control equipment shall be of the explosion-proof type. Fans shall have nonferrous blades. Portable air ducts shall also be of nonferrous materials. All motors and associated control equipment shall be properly maintained and grounded.

(f) Only nonsparking paint buckets, spray guns and tools shall be used. Metal parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner which ensures that it is nonsparking.

(g) Only explosion proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmo-

spheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used.

(h) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within fifty feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

(i) The face, eyes, head, hands and all other exposed parts of the bodies of employees handling highly volatile paints must be protected according to WAC 296-304-090. All footwear must be nonsparking, such as rubbers, rubber boots or rubber soled shoes without nails. Coveralls or other outer clothing must be made of cotton. Rubber gloves, instead of plastic gloves, must be used to protect against the danger of static sparks.

(j) No matches, lighted cigarettes, cigars, or pipes, and no cigarette lighters or ferrous articles shall be taken into the area where work is being done.

(k) All solvent drums taken into the compartment shall be placed on nonferrous surfaces and shall be grounded to the vessel. Metallic contact shall be maintained between containers and drums when materials are being transferred from one to another.

(l) Spray guns, paint pots, and metallic parts of connecting tubing shall be electrically bonded, and the bonded assembly shall be grounded to the vessel.

(m) The employer must ensure that all employees continuously in a compartment in which such painting is performed, are protected by air line respirators and by suitable protective clothing. Employees entering such compartments for a limited time must be protected by filter cartridge type respirators.

(n) The employer must ensure that all employees doing exterior paint spraying with such paints are protected by suitable filter cartridge type respirators and by suitable protective clothing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-304-03007, filed 1/18/05, effective 3/1/05; 03-04-099, § 296-304-03007, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-03007, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-03007, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03007, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03007, filed 3/1/76; Order 74-25, § 296-304-03007, filed 5/7/74.]

**WAC 296-304-03009 Flammable liquids.** (1) In all cases when liquid solvents, paint and preservative removers, paints or vehicles, other than those covered by WAC 296-304-03007(2), are capable of producing a flammable atmosphere under the conditions of use the following precautions shall be taken:

(a) Smoking, open flames, arcs and spark-producing equipment shall be prohibited in the area.

(b) Ventilation shall be provided in sufficient quantities to keep the concentration of vapors below ten percent of their lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.

(c) Scrapings and rags soaked with these materials shall be kept in a covered metal container.

(d) Only explosion proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmo-

spheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used.

(e) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within fifty feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

(f) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

[Order 74-25, § 296-304-03009, filed 5/7/74.]

**WAC 296-304-040 Welding, cutting and heating—Scope and application.** All sections of this chapter which include WAC 296-304-040 in the section number apply to welding, cutting and heating.

You are also required to protect employees from exposure to hexavalent chromium during the stainless steel welding process. See WAC 296-62-08003, Hexavalent chromium for specific criteria.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-16-106, § 296-304-040, filed 8/1/06, effective 9/1/06; Order 74-25, § 296-304-040, filed 5/7/74.]

**WAC 296-304-04001 Ventilation and protection in welding, cutting and heating.** (1) Mechanical ventilation requirements.

(a) For the purposes of this section, mechanical ventilation shall meet the following requirements:

(i) Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

(ii) General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.

(iii) Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits.

(iv) Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

(v) All air replacing that withdrawn shall be clean and respirable.

(vi) Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust or dirt from clothing, or for cleaning the work area.

(2) Welding, cutting and heating in confined spaces.

(a) Except as provided in WAC 296-304-04001 (2)(c) and (3)(b), either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section shall be provided whenever welding, cutting or heating is performed in a confined space.

(b) The means of access shall be provided to a confined space and ventilation ducts to this space shall be arranged in accordance with WAC 296-304-05011 (2)(a) and (b).

(c) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined

space shall be protected by air line respirators in accordance with the requirements of chapter 296-842 WAC, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

(3) Welding, cutting or heating of metals of toxic significance.

(a) Welding, cutting or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section.

(i) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.

(ii) Lead base metals.

(iii) Cadmium-bearing filler materials.

(iv) Chromium-bearing metals or metals coated with chromium-bearing materials.

(b) Welding, cutting, or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with local exhaust ventilation in accordance with the requirements of (1) of this section or employees shall be protected by air line respirators in accordance with the requirements of chapter 296-842 WAC.

(i) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials.

(ii) Cadmium-bearing or cadmium coated base metals.

(iii) Metals coated with mercury-bearing metals.

(iv) Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

(c) Employees performing such operations in the open air shall be protected by filter type respirators in accordance with the requirements of WAC 296-304-09003, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line respirators in accordance with the requirements of chapter 296-842 WAC.

(d) Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

(4) Inert-gas metal-arc welding.

(a) Since the inert-gas metal-arc welding process involves the production of ultraviolet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultraviolet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed to the process until the following special precautions have been taken:

(i) The use of chlorinated solvents shall be kept at least two hundred feet from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.

(ii) Helpers and other employees in the area not protected from the arc by screening as provided in WAC 206-304-04011(5) shall be protected by filter lenses meeting the requirements of Tables I-1A and B (see below). When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type meeting the requirements of WAC 296-304-09001 (1) and (3) shall be worn under welding hel-

mets or hand shields to protect the welder against flashes and radiant energy when either the helmet is lifted or the shield is removed.

(iii) Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultraviolet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.

(iv) When inert-gas metal-arc welding is being performed on stainless steel, the requirements of (3)(b) of this section shall be met to protect against dangerous concentrations of nitrogen dioxide.

(5) General welding, cutting and heating.

(a) Welding, cutting and heating not involving conditions or materials described in (2), (3) or (4) of this section may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

(b) Employees performing any type of welding, cutting or heating shall be protected by suitable eye protective equipment in accordance with the requirements of Tables I-1A and B (see below).

(6) Residues and cargos of metallic ores.

Residues and cargos of metallic ores of toxic significance shall be removed from the area or protected from the heat before welding, cutting or heating is begun.

**TABLE I-1A**  
FILTER LENSES FOR PROTECTION AGAINST  
RADIANT ENERGY

OPERATIONS	ELECTRODE SIZE 1/32 IN	ARC CURRENT	MINIMUM PROTECTIVE SHADE
Shielded metal arc welding	Less than 3	Less than 60	7
	3-5	60-160	8
	5-8	160-250	10
Gas metal arc welding and flux cored arc welding	More than 8	250-550	11
		Less than 60	7
		60-160	10
Gas Tungsten arc welding		160-250	10
		250-550	10
		Less than 50	8
Air carbon arc cutting		50-150	8
	(Light)	150-500	10
	(Heavy)	Less than 500	10
Plasma arc welding		500-1000	11
		Less than 20	6
		20-100	8
Plasma arc cutting		100-400	10
		400-800	11
	(Light)**	Less than 300	8
	(Medium)**	300-400	9
Torch brazing		400-800	10
	(Heavy)**		
			3
Torch soldering	—	—	2
Carbon Arc welding	—	—	14

\*\*These values apply where the actual arc is clearly seen. Lighter filters may be used when the arc is hidden by the workplace.

**TABLE I-1B**  
FILTER LENSES FOR PROTECTION AGAINST  
RADIANT ENERGY

OPERATIONS	PLATE THICKNESS... INCHES	PLATE THICKNESS... MM	MINIMUM* PROTECTIVE SHADE
Gas welding	Under 1/8	Under 3.2	4
	1/8 - 1/2	3.2 - 12.7	5
	Over 1/2	Over 12.7	6
Oxygen cutting	Under 1	Under 25	3
	1 - 6	25 - 100	4
	Over 6	Over 150	5

\*As rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the viable light of the (spectrum) operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-304-04001, filed 1/18/05, effective 3/1/05; 03-04-099, § 296-304-04001, filed 2/4/03, effective 8/1/03. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-04001, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-04001, filed 9/22/93, effective 11/1/93; Order 74-25, § 296-304-04001, filed 5/7/74.]

**WAC 296-304-04005 Welding, cutting and heating in way of preservative coatings.**

(1) Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable they shall be stripped from the area to be heated to prevent ignition. A 1 1/2-inch or larger fire hose with fog nozzle, which has been uncoiled and placed under pressure, shall be immediately available for instant use in the immediate vicinity, consistent with avoiding freezing of the hose.

(3) Protection against toxic preservative coatings.

(a) In enclosed spaces all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application or the employees shall be protected by air line respirators meeting the requirements of chapter 296-62 WAC, Part E.

(b) In the open air employees shall be protected by a filter type respirator in accordance with the requirements of chapter 296-62 WAC, Part E.

(4) Before welding, cutting or heating is commenced in enclosed spaces on metals covered by soft and greasy preservatives, the following precautions shall be taken:

(a) A competent person shall test the atmosphere in the space to ensure that it does not contain explosive vapors, since there is a possibility that some soft and greasy preservatives may have flash points below temperatures which may be expected to occur naturally. If such vapors are determined to be present, no hot work shall be commenced until such precautions have been taken as will ensure that the welding, cutting or heating can be performed in safety.

(b) The preservative coatings shall be removed for a sufficient distance from the area to be heated to ensure that the

temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heated area may be used to limit the size of the area required to be cleaned. The prohibition contained in WAC 296-304-03005 (2)(b) shall apply.

(5) Immediately after welding, cutting or heating is commenced in enclosed spaces on metal covered by soft and greasy preservatives, and at frequent intervals thereafter, a competent person shall make tests to ensure that no flammable vapors are being produced by the coatings. If such vapors are determined to be present, the operation shall be stopped immediately and shall not be resumed until such additional precautions have been taken as are necessary to ensure that the operation can be resumed safely.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-04005, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-04005, filed 9/22/93, effective 11/1/93; Order 74-25, § 296-304-04005, filed 5/7/74.]

**WAC 296-304-04007 Welding, cutting and heating of hollow metal containers and structures not covered by WAC 296-304-02003.** (1) Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested.

(2) Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

(3) Before welding, cutting, heating or brazing is begun on structural voids such as skegs, bilge keels, fair waters, masts, booms, support stanchions, pipe stanchions or railings, a competent person shall inspect the object and, if necessary, test it for the presence of flammable liquids or vapors. If flammable liquids or vapors are present, the object shall be made safe.

(4) Objects such as those listed in (3) of this section shall also be inspected to determine whether water or other non-flammable liquids are present which, when heated, would build up excessive pressure. If such liquids are determined to be present, the object shall be vented, cooled, or otherwise made safe during the application of heat.

(5) Jacketed vessels shall be vented before and during welding, cutting or heating operations in order to release any pressure which may build up during the application of heat.

[Order 76-7, § 296-304-04007, filed 3/1/76; Order 74-25, § 296-304-04007, filed 5/7/74.]

**WAC 296-304-04009 Gas welding and cutting.** (1) Transporting, moving and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secure. Oil shall not be used to lubricate protection caps.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard or pallet. They shall not be hoisted by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by vehicle, they shall be secured in position.

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(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

(h) When work is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valves shall be closed.

(i) Acetylene cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(2) Placing cylinders.

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

(3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by him shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. Only cylinders bearing Interstate Commerce Commission identification and inspection markings shall be used.

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. To permit quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of emergency. In the case of a manifolded or coupled cylinders, at least one such wrench shall always be available for im-

diate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the vessel. In the event that fuel gas should leak from the cylinder valve rather than from the valve stem and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the vessel. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat the cylinder need not be removed from the vessel.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the vessel.

(5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least one (1) inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe and accessible locations in the open air. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage, a wall failure of which would permit the flow of one gas into the other gas passage, shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 8 inches shall be covered by tape.

(c) All hose carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion or be in any way harmful to employees, shall be inspected at the beginning of each shift. Defective hose shall be removed from service.

(d) Hose which has been subjected to flashback or which shows evidence of severe wear or damage shall be tested to twice the normal pressure to which it is subject, but in no case

less than two hundred psi. Defective hose or hose in doubtful condition shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the stowage of gas hose shall be ventilated.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills or other devices designed for such purpose.

(b) Torches shall be inspected at the beginning of each shift for leaking shut-off valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Pressure regulators. Oxygen and fuel gas pressure regulators including their related gauges shall be in proper working order while in use.

[Order 74-25, § 296-304-04009, filed 5/7/74.]

**WAC 296-304-04011 Arc welding and cutting. (1) Manual electrode holders.**

(a) Only manual electrode holders which are specifically designed for arc welding and cutting and are of a capacity capable of safely handling the maximum rated current required by the electrodes shall be used.

(b) Any current carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of ten feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in poor repair shall not be used. When a cable, other than the cable lead referred to in (b), becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tapes or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than

one unit, its safe current carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Structures or pipe lines, except pipelines containing gases or flammable liquids or conduits containing electrical circuits, may be used as part of the ground return circuit, provided that the pipe or structure has a current carrying capacity equal to that required by (2).

(c) When a structure or pipe line is employed as a ground return circuit, it shall be determined that the required electrical contact exists at all joints. The generation of an arc, sparks or heat at any point shall cause rejection of the structure as a ground circuit.

(d) When a structure or pipe line is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the vessel's structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water, since to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(5) Shielding. Whenever practicable, all arc welding and cutting operations shall be shielded by noncombustible or flame-proof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

[Order 74-25, § 296-304-04011, filed 5/7/74.]

**WAC 296-304-04013 Uses of fissionable material in ship-breaking, shipbuilding and ship repairing.** (1) In ship-breaking, shipbuilding and ship repairing and related activities involving the use of and exposure to sources of ionizing radiation not only on conventionally powered but also on nuclear powered vessels, the applicable provisions of the Atomic Energy Commission's Standards for Protection

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Against Radiation (10 CFR Part 20), relating to protection against occupational radiation exposure, shall apply.

(2) Any activity which involves the use of radioactive material, whether or not under license from the Atomic Energy Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee, shall perform such work.

[Order 76-7, § 296-304-04013, filed 3/1/76; Order 74-25, § 296-304-04013, filed 5/7/74.]

**WAC 296-304-050 Scaffolds, ladders and other working surfaces—Scope and application.** All sections of this chapter which include WAC 296-304-050 in the section number apply to scaffolds, ladders and other working surfaces.

[Order 74-25, § 296-304-050, filed 5/7/74.]

**WAC 296-304-05001 Scaffolds or staging.** (1) General requirements.

(a) All scaffolds and their supports whether of lumber, steel or other material, shall be capable of supporting the load they are designed to carry with a safety factor of not less than four.

(b) All lumber used in the construction of scaffolds shall be spruce, fir, long leaf yellow pine, Oregon pine or wood of equal strength. The use of hemlock, short leaf yellow pine, or short fiber lumber is prohibited.

(c) Lumber dimensions as given are nominal except where given in fractions of an inch.

(d) All lumber used in the construction of scaffolds shall be sound, straight-grained, free from cross grain, shakes and large, loose or dead knots. It shall also be free from dry rot, large checks, worm holes or other defects which impair its strength or durability.

(e) Scaffolds shall be maintained in a safe and secure condition. Any component of the scaffold which is broken, burned or otherwise defective shall be replaced.

(f) Barrels, boxes, cans, loose bricks, or other unstable objects shall not be used as working platforms or for the support of planking intended as scaffolds or working platforms.

(g) No scaffold shall be erected, moved, dismantled or altered except under the supervision of competent persons.

(h) No welding, burning, riveting or open flame work shall be performed on any staging suspended by means of fiber rope.

(i) Lifting bridles on working platforms suspended from cranes shall consist of four legs so attached that the stability of the platform is assured.

(j) Unless the crane hook has a safety latch or is moused, the lifting bridles on working platforms suspended from cranes shall be attached by shackles to the lower lifting block or other positive means shall be taken to prevent them from becoming accidentally disengaged from the crane hook.

(2) Independent pole wood scaffolds.

(a) All pole uprights shall be set plumb. Poles shall rest on a foundation of sufficient size and strength to distribute the load and to prevent displacement.

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(b) In light-duty scaffolds not more than 24 feet in height, poles may be spliced by overlapping the ends not less than 4 feet and securely nailing them together. A substantial cleat shall be nailed to the lower section to form a support for the upper section except when bolted connections are used.

(c) All other poles to be spliced shall be squared at the ends of each splice, abutted, and rigidly fastened together by not less than two cleats securely nailed or bolted thereto. Each cleat shall overlap each pole end by at least 24 inches and shall have a width equal to the face of the pole to which it is attached. The combined cross sectional area of the cleats shall be not less than the cross sectional area of the pole.

(d) Ledgers shall extend over two consecutive pole spaces and shall overlap the poles at each end by not less than 4 inches. They shall be left in position to brace the poles as the platform is raised with the progress of the work. Ledgers shall be level and shall be securely nailed or bolted to each pole and shall be placed against the inside face of each pole.

(e) All bearers shall be set with their greater dimension vertical and shall extend beyond the ledgers upon which they rest.

(f) Diagonal bracing shall be provided between the parallel poles, and cross bracing shall be provided between the inner and outer poles or from the outer poles to the ground.

(g) Minimum dimensions and spacing of members shall be in accordance with Table E-1 in WAC 296-304-07011.

(h) Platform planking shall be in accordance with the requirements of (8) of this section.

(i) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(3) Independent pole metal scaffolds.

(a) Metal scaffold members shall be maintained in good repair and free of corrosion.

(b) All vertical and horizontal members shall be fastened together with a coupler or locking device which will form a positive connection. The locking device shall be of a type which has no loose parts.

(c) Posts shall be kept plumb during erection and the scaffold shall be subsequently kept plumb and rigid by means of adequate bracing.

(d) Posts shall be fitted with bases supported on a firm foundation to distribute the load. When wooden sills are used, the bases shall be fastened thereto.

(e) Bearers shall be located at each set of posts, at each level, and at each intermediate level where working platforms are installed.

(f) Tubular bracing shall be applied both lengthwise and crosswise as required.

(g) Platform planking shall be in accordance with the requirements of (8) of this section.

(h) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(4) Wood trestle and extension trestle ladders.

(a) The use of trestle ladders, or extension sections or base sections of extension trestle ladders longer than 20 feet is prohibited. The total height of base and extension may, however, be more than 20 feet.

(b) The minimum dimensions of the side rails of the trestle ladder, or the base sections of the extension trestle ladder, shall be as follows:

(i) Ladders up to and including those 16 feet long shall have side rails of not less than 1 5/16 x 2 3/4 inch lumber.

(ii) Ladders over 16 feet long and up to and including those 20 feet long shall have side rails of not less than 1 5/16 x 3 inch lumber.

(c) The side rails of the extension section of the extension trestle ladder shall be parallel and shall have minimum dimensions as follows:

(i) Ladders up to and including 12 feet long shall have side rails of not less than 1 5/16 x 2 1/4 inch lumber.

(ii) Ladders over 12 feet long and up to and including those 16 feet long shall have side rails of not less than 1 5/16 x 2 1/2 inch lumber.

(iii) Ladders over 16 feet long and up to and including those 20 feet long shall have side rails of not less than 1 5/16 x 3 inch lumber. (Rev. 2-17-76)

(d) Trestle ladders and base sections of extension trestle ladders shall be so spread that when in an open position the spread of the trestle at the bottom, inside to inside, shall be not less than 5 1/2 inches per foot of the length of the ladder.

(e) The width between the side rails at the bottom of the trestle ladder or of the base section of the extension trestle ladder shall be not less than 21 inches for all ladders and sections 6 feet or less in length. For longer lengths of ladder the width shall be increased at least 1 inch for each additional foot of length. The width between the side rails of the extension section of the trestle ladder shall be not less than 12 inches.

(f) In order to limit spreading, the top ends of the side rails of both the trestle ladder and of the base section of the extension trestle ladder shall be beveled, or of equivalent construction, and shall be provided with a metal hinge.

(g) A metal spreader or locking device to hold the front and back sections in an open position, and to hold the extension section securely in the elevated position, shall be a component of each trestle ladder or extension trestle ladder.

(h) Rungs shall be parallel and level. On the trestle ladder, or on the base section of the extension trestle ladder, rungs shall be spaced not less than 8 inches nor more than 18 inches apart; on the extension section of the extension trestle ladder, rungs shall be spaced not less than 6 inches nor more than 12 inches apart.

(i) Platform planking shall be in accordance with the requirements of (8) of this section, except that the width of the platform planking shall not exceed the distance between the side rails.

(j) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(5) Painters' suspended scaffolds.

(a) The supporting hooks of swinging scaffolds shall be constructed to be equivalent in strength to mild steel or wrought iron, shall be forged with care, shall be not less than 7/8 inch in diameter, and shall be secured to a safe anchorage at all times.

(b) The ropes supporting a swinging scaffold shall be equivalent in strength to first-grade 3/4 inch diameter manila rope properly rigged into a set of standard 6 inch blocks consisting of at least one double and one single block.

(c) Manila and wire ropes shall be carefully examined before each operation and thereafter as frequently as may be necessary to ensure their safe condition.

(d) Each end of the scaffold platform shall be supported by a wrought iron or mild steel stirrup or hanger, which in turn is supported by the suspension ropes.

(e) Stirrups shall be constructed so as to be equivalent in strength to wrought iron 3/4 inch in diameter.

(f) The stirrups shall be formed with a horizontal bottom member to support the platform, shall be provided with means to support the guardrail and midrail and shall have a loop or eye at the top for securing the supporting hook on the block.

(g) Two or more swinging scaffolds shall not at any time be combined into one by bridging the distance between them with planks or any other form of platform.

(h) No more than two persons shall be permitted to work at one time on a swinging scaffold built to the minimum specifications contained in this section. Where heavier construction is used, the number of persons permitted to work on the scaffold shall be determined by the size and the safe working load of the scaffold.

(i) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(j) The swinging scaffold platform shall be one of the three types described in (k), (l), and (m) of this section.

(k) The ladder-type platform consists of boards upon a horizontal ladder-like structure, referred to herein as the ladder, the side rails of which are parallel. If this type of platform is used the following requirements shall be met:

(i) The width between the side rails shall be no more than 20 inches.

(ii) The side rails of ladders in ladder-type platforms shall be equivalent in strength to a beam of clear straight-grained spruce of the dimensions contained in Table E-2 in WAC 296-304-07011.

(iii) The side rails shall be tied together with tie rods. The tie rods shall be not less than 5/16 inch in diameter, located no more than 5 feet apart, pass through the rails, and be riveted up tight against washers at both ends.

(iv) The rungs shall be of straight-grained oak, ash, or hickory, not less than 1 1/8 inches diameter, with 7/8 inch tenons mortised into the side rails not less than 7/8 inch and shall be spaced no more than 18 inches on centers.

(v) Flooring strips shall be spaced no more than 5/8 inch apart except at the side rails, where 1 inch spacing is permissible.

(vi) Flooring strips shall be cleated on their undersides.

(l) The plank-type platform consists of planks supported on the stirrups or hangers. If this type of platform is used, the following requirements shall be met:

(i) The planks of plank-type platforms shall be not less than 2 x 10 inch lumber.

(ii) The platform shall be no more than 24 inches in width.

(iii) The planks shall be tied together by cleats of not less than 1 x 6 inch lumber, nailed on their undersides at intervals of not more than 4 feet.

(iv) The planks shall extend not less than 6 inches nor more than 18 inches beyond the supporting stirrups.

(v) A cleat shall be nailed across the platform on the underside at each end outside the stirrup to prevent the platform from slipping off the stirrup.

(vi) Stirrup supports shall be not more than 10 feet apart.

(m) The beam-type platform consists of longitudinal side stringers with cross beams set on edge and spaced not more than 4 feet apart on which longitudinal platform planks are laid. If this type platform is used the following requirements shall be met:

(i) The side stringers shall be of sound, straight-grained lumber, free from knots, and of not less than 2 x 6 inch lumber, set on edge.

(ii) The stringers shall be supported on the stirrups with a clear span between stirrups of not more than 16 feet.

(iii) The stringers shall be bolted to the stirrups by U-bolts passing around the stirrups and bolted through the stringers with nuts drawn up tight on the inside face.

(iv) The ends of the stringers shall extend beyond the stirrups not less than 6 inches nor more than 12 inches at each end of the platform.

(v) The platform shall be supported on cross beams of 2 x 6 inch lumber between the side stringers securely nailed thereto and spaced not more than 4 feet on centers.

(vi) The platform shall be not more than 24 inches wide.

(vii) The platform shall be formed of boards 7/8 inch in thickness by not less than 6 inches in width, nailed tightly together, and extending to the outside face of the stringers.

(viii) The ends of all platform boards shall rest on the top of the cross beams, shall be securely nailed, and at no intermediate points in the length of the platform shall there be any cantilever ends.

(6) Horse scaffolds.

(a) The minimum dimensions of lumber used in the construction of horses shall be in accordance with Table E-3 in WAC 296-304-07011.

(b) Horses constructed of materials other than lumber shall provide the strength, rigidity and security required of horses constructed of lumber.

(c) The lateral spread of the legs shall be equal to not less than one-third of the height of the horse.

(d) All horses shall be kept in good repair, and shall be properly secured when used in staging or in locations where they may be insecure.

(e) Platform planking shall be in accordance with the requirements of (8) of this section.

(f) Backrails and toeboards shall be in accordance with (9) of this section.

(7) Other types of scaffolds.

(a) Scaffolds of a type for which specifications are not contained in this section shall meet the general requirements of (1), (8) and (9) of this section, shall be in accordance with recognized principles of design and shall be constructed in accordance with accepted standards covering such equipment.

(8) Scaffold or platform planking.

(a) Except as otherwise provided in (5)(k) and (m), platform planking shall be of not less than 2 x 10 inch lumber. Platform planking shall be straight-grained and free from large or loose knots and may be either rough or dressed.

(b) Platforms of staging shall be not less than two 10 inch planks in width except in such cases as the structure of the vessel or the width of the trestle ladders make it impossible to provide such a width.

(c) Platform planking shall project beyond the supporting members at either end by at least 6 inches but in no case

shall project more than 12 inches unless the planks are fastened to the supporting members.

(d) Table E-4 in WAC 296-304-07011 shall be used as a guide in determining safe loads for scaffold planks.

(9) Backrails and toeboards.

(a) Scaffolding, staging, runways, or working platforms which are supported or suspended more than 5 feet above a solid surface, or at any distance above the water, shall be provided with a railing which has a top rail whose upper surface is from 42 to 45 inches above the upper surface of the staging, platform, or runway and a midrail located halfway between the upper rail and the staging, platform, or runway.

(b) Rails shall be of 2 x 4 inch lumber, flat bar or pipe. When used with rigid supports, taut wire or fiber rope of adequate strength may be used. If the distance between supports is more than 8 feet, rails shall be equivalent in strength to 2 x 4 inch lumber. Rails shall be firmly secured. Where exposed to hot work or chemicals, fiber rope rails shall not be used.

(c) Rails may be omitted where the structure of the vessel prevents their use. When rails are omitted employees working more than 5 feet above solid surfaces shall be protected by safety belts and life lines meeting the requirements of WAC 296-304-09021(2), and employees working over water shall be protected by personal flotation devices meeting the requirements of WAC 296-304-09017(1).

(d) Employees working from swinging scaffolds which are triced out of a vertical line below their supports or from scaffolds on paint floats subject to surging, shall be protected against falling toward the vessel by a railing or a safety belt and line attached to the backrail.

(e) When necessary, to prevent tools and materials from falling on men below, toeboards of not less than 1 x 4 inch lumber shall be provided.

(10) Access to staging.

(a) Access from below to staging more than 5 feet above a floor, deck or the ground shall consist of well secured stairways, cleated ramps, fixed or portable ladders meeting the applicable requirements of WAC 296-304-05003 or rigid type noncollapsible trestles with parallel and level rungs.

(b) Ramps and stairways shall be provided with 36-inch handrails with midrails.

(c) Ladders shall be so located or other means shall be taken so that it is not necessary for employees to step more than one foot from the ladder to any intermediate landing or platform.

(d) Ladders forming integral parts of prefabricated staging are deemed to meet the requirements of these regulations.

(e) Access from above to staging more than 3 feet below the point of access shall consist of a straight, portable ladder meeting the applicable requirements of WAC 296-304-05003 or a Jacob's ladder properly secured, meeting the requirements of WAC 296-304-05007(4).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-05001, filed 2/4/03, effective 8/1/03; Order 76-7, § 296-304-05001, filed 3/1/76; Order 74-25, § 296-304-05001, filed 5/7/74.]

**WAC 296-304-05003 Ladders.** (1) General requirements.

(a) The use of ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective

construction is prohibited. When ladders with such defects are discovered, they shall be immediately withdrawn from service. Inspection of metal ladders shall include checking for corrosion of interiors of open end, hollow rungs.

(b) When sections of ladders are spliced, the ends shall be abutted, and not fewer than 2 cleats shall be securely nailed or bolted to each rail. The combined cross sectional area of the cleats shall be not less than the cross sectional area of the side rail. The dimensions of side rails for their total length shall be those specified in (2) or (3) of this section.

(c) Portable ladders shall be lashed, blocked or otherwise secured to prevent their being displaced. The side rails of ladders used for access to any level shall extend not less than 36 inches above that level. When this is not practical, grab rails which will provide a secure grip for an employee moving to or from the point of access shall be installed.

(d) Portable metal ladders shall be of strength equivalent to that of wood ladders. Manufactured portable metal ladders provided by the employer shall be in accordance with the provisions of the United States of America Standard Safety Code for Portable Metal Ladders, A14.2.

(e) Portable metal ladders shall not be used near electrical conductors nor for electric arc welding operations.

(f) Manufactured portable wood ladders provided by the employer shall be in accordance with the provisions of the United States of America Standard Safety Code for Portable Wood Ladders, A-14.

(2) Construction of portable wood cleated ladders up to 30 feet in length.

(a) Wood side rails shall be made from west coast hemlock, eastern spruce, Sitka spruce, or wood of equivalent strength. Material shall be seasoned, straight-grained wood, and free from shakes, checks, decay or other defects which will impair its strength. The use of low density woods is prohibited.

(b) Side rails shall be dressed on all sides, and kept free of splinters.

(c) All knots shall be sound and hard. The use of material containing loose knots is prohibited. Knots shall not appear on the narrow face of the rail and, when in the side face, shall be not more than 1/2 inch in diameter or within 1/2 inch of the edge of the rail or nearer than 3 inches to a tread or rung.

(d) Pitch pockets not exceeding 1/8 inch in width, 2 inches in length and 1/2 inch in depth are permissible in wood side rails, provided that not more than one such pocket appears in each 4 feet of length.

(e) The width between side rails at the base shall be not less than 11 1/2 inches for ladders 10 feet or less in length. For longer ladders this width shall be increased at least 1/4 inch for each additional 2 feet in length.

(f) Side rails shall be at least 1 5/8 x 3 5/8 inches in cross section.

(g) Cleats (meaning rungs rectangular in cross section with the wide dimension parallel to the rails) shall be of the material used for side rails, straight-grained and free from knots. Cleats shall be mortised into the edges of the side rails 1/2 inch, or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with three 10d common wire nails or fastened with through bolts or other fasteners of equivalent strength. Cleats shall be uniformly spaced not more than 12 inches apart.

(h) Cleats 20 inches or less in length shall be at least 25/32 x 3 inches in cross section. Cleats over 20 inches but not more than 30 inches in length shall be at least 25/32 x 3 3/4 inches in cross section.

(3) Construction of portable wood cleated ladders from 30 to 60 feet in length.

(a) Ladders from 30 to 60 feet in length shall be in accordance with the specifications of (2) of this section with the following exceptions:

(i) Rails shall be of not less than 2 x 6 inch lumber.

(ii) Cleats shall be of not less than 1 x 4 inch lumber.

(iii) Cleats shall be nailed to each rail with five 10d common wire nails or fastened with through bolts or other fastenings of equivalent strength.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-05003, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-05003, filed 5/7/74.]

**WAC 296-304-05005 Guarding of deck openings and edges.** (1) When employees are working in the vicinity of flush manholes and other small openings of comparable size in the deck and other working surfaces, such openings shall be suitably covered or guarded to a height of not less than 30 inches, except where the use of such guards is made impracticable by the work actually in progress.

(2) When employees are working around open hatches not protected by coamings to a height of 24 inches or around other large openings, the edge of the opening shall be guarded in the working area to a height of 36 to 42 inches, except where the use of such guards is made impracticable by the work actually in progress.

(3) When employees are exposed to unguarded edges of decks, platforms, flats, and similar flat surfaces, more than 5 feet above a solid surface, the edges shall be guarded by adequate guardrails meeting the requirements of WAC 296-304-05001 (1)(a) and (b), unless the nature of the work in progress or the physical conditions prohibit the use or installation of such guardrails.

(4) When employees are working near the unguarded edges of decks of vessels afloat, they shall be protected by buoyant personal flotation devices, meeting the requirements of WAC 296-304-09017(1).

(5) Sections of bilges from which floor plates or gratings have been removed shall be guarded by guardrails except where they would interfere with work in progress. If these open sections are in a walkway at least two 10-inch planks placed side by side, or equivalent, shall be laid across the opening to provide a safe walking surface.

(6) Gratings, walkways, and catwalks, from which sections or ladders have been removed, shall be barricaded with adequate guardrails.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-05005, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-05005, filed 5/7/74.]

**WAC 296-304-05007 Access to vessels. "Barge" - An unpowered, flat bottom, shallow draft vessel including scows, carfloats and lighters, but not ship-shaped or deep-draft barges.**

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**"River towboat" - A shallow draft, low free board, self-propelled vessel designed to tow river barges by pushing ahead.**

(1) Access to vessels afloat. The employer shall not permit employees to board or leave any vessel, except a barge or river towboat, until the following requirements have been met:

(a) Whenever practicable, a gangway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a gangway nor a straight ladder can be used, a Jacob's ladder meeting the requirements of (4)(a) and (b) of this section may be used.

(b) Each side of such gangway, and the turntable if used, shall have a railing with a minimum height of approximately 33 inches measured perpendicularly from rail to walking surface at the stanchion, with a midrail. Rails shall be of wood, pipe, chain, wire or rope and shall be kept taut at all times.

(c) Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the foregoing requirements, except in cases where the vessel's regular gangway is not being used.

(d) The gangway shall be kept properly trimmed at all times.

(e) When a fixed tread accommodation ladder is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.

(f) When the lower end of a gangway overhangs the water between the ship and the dock in such a manner that there is danger of employees falling between the ship and the dock, a net or other suitable protection shall be rigged at the foot of the gangway in such a manner as to prevent employees from falling from the end of the gangway.

(g) If the foot of the gangway is more than one foot away from the edge of the apron, the space between them shall be bridged by a firm walkway equipped with railings, with a minimum height of approximately 33 inches with midrails on both sides.

(h) Supporting bridles shall be kept clear so as to permit unobstructed passage for employees using the gangway.

(i) When the upper end of the means of access rests on or flush with the top of the bulwark, substantial steps properly secured and equipped with at least one substantial handrail approximately 33 inches in height shall be provided between the top of the bulwark and the deck.

(j) Obstructions shall not be laid on or across the gangway.

(k) The means of access shall be adequately illuminated for its full length.

(l) Unless the construction of the vessel makes it impossible, the means of access shall be so located that drafts of cargo do not pass over it. In any event loads shall not be passed over the means of access while employees are on it.

(2) Access to vessels in drydock or between vessels. Gangways meeting the requirements of (1)(a), (b), (i), (j) and (l) of this section shall be provided for access from wing wall

to vessel or, when two or more vessels, other than barges or river towboats, are lying abreast, from one vessel to another.

(3) Access to barges and river towboats.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp in accordance with the requirements of (a) of this section or a safe walkway in accordance with the requirements of (1)(g) of this section shall be provided. When a walkway is impracticable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a walkway nor a straight ladder can be used, a Jacob's ladder in accordance with the requirements of (4) of this section may be used.

(c) The means of access shall be in accordance with the requirements of (1)(i), (j) and (k) of this section.

(4) Jacob's ladders.

(a) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(b) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-05007, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-05007, filed 5/7/74.]

**WAC 296-304-05009 Access to and guarding of dry docks and marine railways.** (1) A gangway, ramp or permanent stairway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and securely fastened, shall be provided between a floating dry dock and the pier or bulkhead.

(2) Each side of such gangway, ramp or permanent stairway, including those which are used for access to wing walls from dry dock floors, shall have a railing with a midrail. Such railings on gangways or ramps shall be approximately 42 inches in height; and railings on permanent stairways shall be not less than approximately 30 or more than approximately 34 inches in height. Rails shall be of wood, pipe, chain, wire, or rope and shall be kept taut at all times.

(3) Railings meeting the requirements of (2) of this section shall be provided on the means of access to and from the floors of graving docks.

(4) Railings approximately 42 inches in height, with a midrail, shall be provided on the edges of wing walls of floating dry docks and on the edges of graving docks. Sections of the railings may be temporarily removed where necessary to permit line handling while a vessel is entering or leaving the dock.

(5) When employees are working on the floor of a floating dry dock where they are exposed to the hazard of falling into the water, the end of the dry dock shall be equipped with portable stanchions and 42 inch railings with a midrail. When such a railing would be impracticable or ineffective, other effective means shall be provided to prevent employees from falling into the water.

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(6) Access to wingwalls from floors of dry docks shall be by ramps, permanent stairways or ladders meeting the applicable requirements of WAC 296-304-05003.

(7) Catwalks on stiles of marine railways shall be no less than 20 inches wide and shall have on at least one side a guardrail and midrail meeting the requirements of WAC 296-304-05001 (9)(a) and (b).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-05009, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-05009, filed 5/7/74.]

**WAC 296-304-05011 Access to cargo spaces and confined spaces.** (1) Cargo spaces.

(a) There shall be at least one safe and accessible ladder in any cargo space which employees must enter.

(b) When any fixed ladder is visibly unsafe, the employer shall prohibit its use by employees.

(c) Straight ladders of adequate strength and suitably secured against shifting or slipping shall be provided as necessary when fixed ladders in cargo spaces do not meet the requirements of (a) of this section. When conditions are such that a straight ladder cannot be used, a Jacob's ladder meeting the requirements of WAC 296-304-05007(4) may be used.

(d) When cargo is stowed within 4 inches of the back of ladder rungs, the ladder shall be deemed "unsafe" for the purpose of this section.

(e) Fixed ladders or straight ladders provided for access to cargo spaces shall not be used at the same time that cargo drafts or other loads are entering or leaving the hold. Before using these ladders to enter or leave the hold, the employee shall be required to inform the winchman or crane signalman of his intention.

(2) Confined spaces.

(a) More than one means of access shall be provided to a confined space in which employees are working and in which the work may generate a hazardous atmosphere in the space except where the structure or arrangement of the vessel makes this provision impractical.

(b) When the ventilation ducts required by these regulations must pass through these means of access, the ducts shall be of such a type and so arranged as to permit free passage of an employee through at least two of these means of access.

[Order 74-25, § 296-304-05011, filed 5/7/74.]

**WAC 296-304-05013 Working surfaces.** (1) When firebox floors present tripping hazards of exposed tubing or of missing or removed refractory, sufficient planking to afford safe footing shall be laid while work is being carried on within the boiler.

(2) The employer must provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface.

(a) Employees must be protected by the use of scaffolds, ladders, or personal protection equipment according to WAC 296-304-09021, or 296-304-09023.

(b) Employees must work from scaffolds when visually restricted by:

- Blasting hoods;
- Welding helmets; and
- Burning goggles; except

- For the initial and final welding or burning operation to start or complete a job such as the erection and dismantling of hung scaffolding; or

- Other similar, nonrepetitive jobs of brief duration.

(3) For work performed in restricted quarters, such as behind boilers and in between congested machinery units and piping, work platforms at least 20 inches wide meeting the requirements of WAC 296-304-05001 (8)(b) shall be used. Backrails may be omitted if bulkheading, boilers, machinery units, or piping afford proper protection against falling.

(4) When employees are boarding, leaving, or working from small boats or floats, they shall be protected by personal flotation devices meeting the requirements of WAC 296-304-09017(1).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-05013, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-05013, filed 12/26/97, effective 3/1/98; Order 76-7, § 296-304-05013, filed 3/1/76; Order 74-25, § 296-304-05013, filed 5/7/74.]

**WAC 296-304-060 General working conditions— Scope and application.** All sections of this chapter which include WAC 296-304-060 in the section number apply to general working conditions.

[Order 74-25, § 296-304-060, filed 5/7/74.]

**WAC 296-304-06001 Housekeeping.** (1) Good housekeeping conditions shall be maintained at all times. Adequate aisles and passageways shall be maintained in all work areas. All staging platforms, ramps, stairways, walkways, aisles, and passageways on vessels or dry docks shall be kept clear of all tools, materials, and equipment except that which is in use, and all debris such as welding rod tips, bolts, nuts, and similar material. Hose and electric conductors shall be elevated over or placed under the walkway or working surfaces or covered by adequate crossover planks.

(2) All working areas on vessels and dry docks shall be kept reasonably free of debris, and construction material shall be so piled as not to present a hazard to employees.

(3) Slippery conditions on walkways or working surfaces shall be eliminated as they occur.

(4) Free access shall be maintained at all times to all exits and to all fire-alarm boxes or fire-extinguishing equipment.

(5) All oils, paints, thinners, solvents waste, rags, or other flammable substances shall be kept in fire resistant covered containers when not in use.

[Order 74-25, § 296-304-06001, filed 5/7/74.]

**WAC 296-304-06003 Illumination.** (1) All means of access and walkways leading to working areas as well as the working areas themselves shall be adequately illuminated.

(2) Temporary lights shall meet the following requirements:

(a) Temporary lights shall be equipped with guards to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

(b) Temporary lights shall be equipped with heavy duty electric cords with connections and insulation maintained in safe condition. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for

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this means of suspension. Splices which have insulation equal to that of the cable are permitted.

(c) Cords shall be kept clear of working spaces and walkways or other locations in which they are readily exposed to damage.

(3) Exposed noncurrent-carrying metal parts of temporary lights furnished by the employer shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current. Grounding shall be in accordance with the requirements of WAC 296-304-08003(2).

(4) Where temporary lighting from sources outside the vessel is the only means of illumination, portable emergency lighting equipment shall be available to provide illumination for safe movement of employees.

(5) Employees shall not be permitted to enter dark spaces without a suitable portable light. The use of matches and open flame lights is prohibited. In nongas free spaces, portable lights shall meet the requirements of WAC 296-304-02005 (2)(i).

(6) Temporary lighting stringers or streamers shall be so arranged as to avoid overloading of branch circuits. Each branch circuit shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-06003, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-06003, filed 5/7/74.]

**WAC 296-304-06005 Utilities.** (1) Steam supply and hoses.

(a) Prior to supplying a vessel with steam from a source outside the vessel, the employer shall ascertain from responsible vessel's representatives, having knowledge of the condition of the plant, the safe working pressure of the vessel's steam system. The employer shall install a pressure gauge and a relief valve of proper size and capacity at the point where the temporary steam hose joins the vessel's steam piping system or systems. The relief valve shall be set and capable of relieving at a pressure not exceeding the safe working pressure of the vessel's system in its present condition, and there shall be no means of isolating the relief valve from the system which it protects. The pressure gauge and relief valve shall be located so as to be visible and readily accessible.

(b) Steam hose and fittings shall have a safety factor of not less than five.

(c) When steam hose is hung in a bight or bights, the weight shall be relieved by appropriate lines. The hose shall be protected against chafing.

(d) Steam hose shall be protected from damage and hose and temporary piping shall be so shielded where passing through normal work areas as to prevent accidental contact by employees.

(2) Electric power.

(a) When the vessel is supplied with electric power from a source outside the vessel, the following precautions shall be taken prior to energizing the vessel's circuits:

(i) If in dry dock, the vessel shall be adequately grounded.

(ii) The employer shall ascertain from responsible vessel's representatives, having a knowledge of the condition of

the vessel's electrical system, that all circuits to be energized are in a safe condition.

(iii) All circuits to be energized shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.

(3) Infrared electrical heat lamps.

(a) All infrared electrical heat lamps shall be equipped with guards that surround the lamps with the exception of the face, to minimize accidental contact with the lamps.

[Order 74-25, § 296-304-06005, filed 5/7/74.]

**WAC 296-304-06007 Work in confined or isolated spaces.** When any work is performed in a confined space, except as provided in WAC 296-304-04001 (2)(c), or when an employee is working alone in an isolated location, frequent checks shall be made to ensure the safety of the employees.

[Order 74-25, § 296-304-06007, filed 5/7/74.]

**WAC 296-304-06009 Work on or in the vicinity of radar and radio.** (1) No employees other than radar or radio repairmen shall be permitted to work on masts, king posts or other aloft areas unless the radar and radio are secured or otherwise made incapable of radiation. In either event, the radio and radar shall be appropriately tagged.

(2) Testing of radar or radio shall not be done until the employer can schedule such tests at a time when no work is in progress aloft or personnel can be cleared from the danger area according to minimum safe distances established for and based on the type, model, and power of the equipment.

[Order 74-25, § 296-304-06009, filed 5/7/74.]

**WAC 296-304-06011 Work in or on lifeboats.** (1) Before employees are permitted to work in or on a lifeboat, either stowed or in a suspended position, the employer shall ensure that the boat is secured independently of the releasing gear to prevent the boat from falling due to accidental tripping of the releasing gear and movement of the davits or capsizing of a boat in chocks.

(2) Employees shall not be permitted to remain in boats while the boats are being hoisted into final stowed position.

(3) Employees shall not be permitted to work on the outboard side of lifeboats stowed on their chocks unless the boats are secured by gripes or otherwise secured to prevent them from swinging outboard.

[Order 74-25, § 296-304-06011, filed 5/7/74.]

**WAC 296-304-06013 Health and sanitation. "Hazardous material"** - A material with one or more of the following characteristics:

- Has a flash point below 140°F, closed cup, or is subject to spontaneous heating;
- Has a threshold limit value below 500 p.p.m. in the case of a gas or vapor, below 500 mg./m.3 for fumes, and below 25 m.p.p.c.f. in case of a dust;
- Has a single dose oral LD50 below 500 mg./kg.;
- Is subject to polymerization with the release of large amounts of energy;
- Is a strong oxidizing or reducing agent;

[Title 296 WAC—p. 2304]

- Causes first degree burns to skin in short time exposure, or is systematically toxic by skin contact; or

- In the course of normal operations, may produce dusts, gases, fumes, vapors, mists, or smokes that have one or more of the above characteristics.

(1) No chemical product, such as a solvent or preservative; no structural material, such as cadmium or zinc coated steel, or plastic material; and no process material, such as welding filler metal; which is a hazardous material may be used until the employer has ascertained the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling, application, or utilization of such a material.

(2) In order to ascertain the hazards, as required by subsection (1) of this section, the employer shall obtain the following items of information which are applicable to a specific product or material to be used:

(a) The name, address, and telephone number of the source of the information specified in this section preferably those of the manufacturer of the product or material.

(b) The trade name and synonyms for a mixture of chemicals, a basic structural material, or for a process material; and the chemical name and synonyms, chemical family, and formula for a single chemical.

(c) Chemical names of hazardous ingredients, including, but not limited to, those in mixtures, such as those in: (i) Paints, preservatives, and solvents; (ii) alloys, metallic coatings, filler metals and their coatings or core fluxes; and (iii) other liquids, solids, or gases (e.g., abrasive materials).

(d) An indication of the percentage, by weight or volume, which each ingredient of a mixture bears to the whole mixture, and of the threshold limit value of each ingredient, in appropriate units.

(e) Physical data about a single chemical or a mixture of chemicals, including boiling point, in degrees Fahrenheit; vapor pressure, in millimeters of mercury; vapor density of gas or vapor (air=1); solubility in water, in percent by weight; specific gravity of material (water=1); percentage volatile, by volume, at 70°F.; evaporation rate for liquids (either butyl acetate or ether may be taken as 1); and appearance and odor.

(f) Fire and explosion hazard data about a single chemical or a mixture of chemicals, including flashpoint, in degrees Fahrenheit; flammable limits, in percent by volume in air; suitable extinguishing media or agents; special fire fighting procedures; and unusual fire and explosion hazard information.

(g) Health hazard data, including threshold limit value, in appropriate units, for a single hazardous chemical or for the individual hazardous ingredients of a mixture as appropriate, effects of overexposure; and emergency and first-aid procedures.

(h) Reactivity data, including stability, incompatibility, hazardous decomposition products, and hazardous polymerization.

(i) Procedures to be followed and precautions to be taken in cleaning up and disposing of materials leaked or spilled.

(j) Special protection information, including use of personal protective equipment, such as respirators, eye protection, and protective clothing, and of ventilation, such as local exhaust, general, special, or other types.

(k) Special precautionary information about handling and storing.

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(1) Any other general precautionary information.

(3) The pertinent information required by subsection (2) of this section shall be recorded either on United States Department of Labor Form LSB 00S-4, Material Safety Data Sheet, or on an essentially similar form which has been approved by the department of labor and industries. Copies of Form LSB 00S-4 may be obtained at any of the following regional offices of the occupational safety and health administration:

(a) Pacific region. (Arizona, California, Hawaii, and Nevada.)

10353 Federal Building, 450 Golden Gate Avenue, Box 36017, San Francisco, Calif. 94102.

(b) Region X, OSHA, (Alaska, Washington, Idaho, and Oregon), Federal Office Building, 909 First Avenue, Seattle, Washington 98174.

A completed MSDS form shall be preserved and available for inspection for each hazardous chemical on the work-site.

(4) The employer shall instruct employees who will be exposed to the hazardous materials as to the nature of the hazards and the means of avoiding them.

(5) The employer shall provide all necessary controls, and the employees shall be protected by suitable personal protective equipment against the hazards identified under subsection (1) of this section and those hazards for which specific precautions are required in WAC 296-304-020 through 296-304-04013.

(6) The employer shall provide adequate washing facilities for employees engaged in the application of paints or coatings or in other operations where contaminants can, by ingestion or absorption, be detrimental to the health of the employees. The employer shall encourage good personal hygiene practices by informing the employees of the need for removing surface contaminants by thorough washing of hands and face prior to eating or smoking.

(7) The employer shall not permit eating or smoking in areas undergoing surface preparation or preservation or where shiprepairing, shipbuilding, or shipbreaking operations produce atmospheric contamination.

(8) The employer shall not permit employees to work in the immediate vicinity of uncovered garbage and shall ensure that employees working beneath or on the outboard side of a vessel are not subject to contamination by drainage or waste from overboard discharges.

(9) Requirements of WAC 296-800-170, Chemical hazard communication program, will apply to shiprepairing, shipbuilding, and shipbreaking when potential hazards of chemicals and communicating information concerning hazards and appropriate protective equipment is applicable to an operation.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-304-06013, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-06013, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-06013, filed 1/18/95, effective 3/10/95; 88-14-108 (Order 88-11), § 296-304-06013, filed 7/6/88; Order 76-7, § 296-304-06013, filed 3/1/76; Order 74-25, § 296-304-06013, filed 5/7/74.]

**WAC 296-304-06015 First aid.** (1) Unless a first-aid room and a qualified attendant are close at hand and prepared to render first aid to employees on behalf of the employer, the

employer shall furnish a first-aid kit for each vessel on which work is being performed, except that when work is being performed on more than one small vessel at one pier, only one kit shall be required. The kit, when required, shall be kept close to the vessel and at least one employee, close, at hand, shall be qualified to administer first aid to the injured.

(2) The first-aid kit shall consist of a weatherproof container with individual sealed packages for each type of item. The contents of such kit shall contain a sufficient quantity of at least the following types of items:

Gauze roller bandages, 1 inch and 2 inch.

Gauze compress bandages, 4 inch.

Adhesive bandages, 1 inch.

Triangular bandage, 40 inch.

Ammonia inhalants and ampules.

Antiseptic applicators or swabs.

Burn dressing.

Eye dressing.

Wire or thin board splints.

Forceps and tourniquet.

(3) The contents of the first-aid kit shall be checked before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.

(4) There shall be available for each vessel on which ten or more employees are working one Stokes basket stretcher, or equivalent, permanently equipped with bridles for attaching to the hoisting gear, except that no more than two stretchers are required on each job location. A blanket or other liner suitable for transferring the patient to and from the stretcher shall be provided. Stretchers shall be kept close to the vessels. This section does not apply where ambulance services which are available are known to carry such stretchers.

[Order 74-25, § 296-304-06015, filed 5/7/74.]

**WAC 296-304-070 Gear and equipment for rigging and materials handling—Scope and application.** All sections of this chapter which include WAC 296-304-070 in the section number apply to gear and equipment for rigging and materials handling.

[Order 74-25, § 296-304-070, filed 5/7/74.]

**WAC 296-304-07001 Inspection.** (1) All gear and equipment provided by the employer for rigging and materials handling shall be inspected before each shift and, when necessary, at intervals during its use to ensure that is safe. Defective gear shall be removed and repaired or replaced before further use.

(2) The safe working load of gear as specified in WAC 296-304-07003 and 296-304-07005 shall not be exceeded.

[Order 74-25, § 296-304-07001, filed 5/7/74.]

**WAC 296-304-07003 Ropes, chains and slings.** (1) Manila rope and manila rope slings.

(a) Table G-1 in WAC 296-304-07011 shall be used to determine the safe working load of various sizes of manila rope and manila rope slings at various angles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable prod-

ucts: Provided, That a safety factor of not less than five is maintained.

(2) Wire rope and wire rope slings.

(a) Tables G-2 through G-5 in WAC 296-304-07011 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed: Provided, That a safety factor of not less than five is maintained.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Where U-bolt wire rope clips are used to form eyes, Table G-6 in WAC 296-304-07011 shall be used to determine the number and spacing of clips. The U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(d) Wire rope shall not be secured by knots.

(3) Chains and chain slings.

(a) Tables G-7 and G-8 in WAC 296-304-07011 shall be used to determine the working load limit of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products.

(b) All sling chains, including end fastenings, shall be given a visual inspection before being used on the job. A thorough inspection of all chains in use shall be made every 3 months. Each chain shall bear an indication of the month in which it was thoroughly inspected. The thorough inspection shall include inspection for wear, defective welds, deformation and increase in length or stretch.

(c) Interlink wear, not accompanied by stretch in excess of 5 percent, shall be noted and the chain removed from service when maximum allowable wear at any point of link, as indicated in Table G-9 in WAC 296-304-07011 has been reached.

(d) Chain slings shall be removed from service when, due to stretch, the increase in length of a measured section exceeds five percent; when a link is bent, twisted or otherwise damaged; or when raised scarfs or defective welds appear.

(e) All repairs to chains shall be made under qualified supervision. Links or portions of the chain found to be defective as described in (d) of this section shall be replaced by links having proper dimensions and made of material similar to that of the chain. Before repaired chains are returned to service, they shall be proof tested to the proof test load recommended by the manufacturer.

(f) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months when recommended by the manufacturer. The chain manufacturer shall be consulted for recommended procedures for annealing or normalizing. Alloy chains shall never be annealed.

(g) A load shall not be lifted with a chain having a kink or knot in it. A chain shall not be shortened by bolting, wiring or knotting.

[Order 76-7, § 296-304-07003, filed 3/1/76; Order 74-25, § 296-304-07003, filed 5/7/74.]

[Title 296 WAC—p. 2306]

**WAC 296-304-07005 Shackles and hooks.** (1) Shackles.

(a) Table G-10 in WAC 296-304-07011 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products: Provided, That a safety factor of not less than five is maintained.

(2) Hooks.

(a) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(b) Loads shall be applied to the throat of the hook since loading the point overstresses and bends or springs the hook.

(c) Hooks shall be inspected periodically to see that they have not been bent by overloading. Bent or sprung hooks shall not be used.

[Order 76-7, § 296-304-07005, filed 3/1/76; Order 74-25, § 296-304-07005, filed 5/7/74.]

**WAC 296-304-07007 Chain falls and pull-lifts.** (1) Chain falls and pull-lifts shall be clearly marked to show the capacity and the capacity shall not be exceeded.

(2) Chain falls shall be regularly inspected to ensure that they are safe, particular attention being given to the lift chain, pinion, sheaves and hooks for distortion and wear. Pull-lifts shall be regularly inspected to ensure that they are safe, particular attention being given to the ratchet, pawl, chain and hooks for distortion and wear.

(3) Straps, shackles, and the beam or overhead structure to which a chain fall or pull-lift is secured shall be of adequate strength to support the weight of load plus gear. The upper hook shall be moused or otherwise secured against coming free of its support.

(4) Scaffolding shall not be used as a point of attachment for lifting devices, such as tackles, chain falls, and pull-lifts unless the scaffolding is specifically designed for that purpose.

[Order 74-25, § 296-304-07007, filed 5/7/74.]

**WAC 296-304-07009 Hoisting and hauling equipment.** (1) Derrick and crane certification:

(a) Derricks and cranes which are part of, or regularly placed aboard barges, other vessels, or on wingwalls of floating drydocks, and are used to transfer materials or equipment from or to a vessel or drydock, shall be tested and certificated in accordance with the standards provided in WAC 296-304-130 gear certification, by persons accredited for that purpose.

(b) Subsection (a) of this section shall take effect 180 days after the effective date of the amendment.

(2) The moving parts of hoisting and hauling equipment shall be guarded.

(3) Mobile crawler or truck cranes used on a vessel:

(a) The maximum manufacturer's rated safe working loads for the various working radii of the boom and the maximum and minimum radii at which the boom may be safely used with and without outriggers shall be conspicuously

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posted near the controls and shall be visible to the operator. A radius indicator shall be provided.

(b) The posted safe working loads of mobile crawler or truck cranes under the conditions of use shall not be exceeded.

(4) Accessible areas within the swing radius of the outermost part of the body of a revolving derrick or crane whether permanently or temporarily mounted, shall be guarded in such a manner as to prevent an employee from being in such a position as to be struck by the crane or caught between the crane and fixed parts of the vessel or of the crane itself.

(5) Marine railways:

(a) The cradle or carriage on the marine railway shall be positively blocked or secured when in the hauled position to prevent it from being accidentally released.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-07009, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-07009, filed 5/7/74.]

**WAC 296-304-07011 Use of gear.** (1) Loads shall be safely rigged before being hoisted.

(2) Plates shall be handled on and off hulls by means of shackles whenever possible. Clips or pads of ample size shall be welded to the plate to receive the shackle pins whenever there are no holes in the plate. When it is not possible to make holes in or to weld pads to the plate, alligator tongs, grab hooks, grab clamps or screw clamps may be used. In such cases special precautions shall be taken to keep employees from under such lifts.

(3) Tag lines shall be provided on loads likely to swing or to need guidance.

(4) When slings are secured to eyebolts, the slings shall be so arranged, using spreaders if necessary, that the pull is within 20 degrees of the axis of the bolt.

(5) Slings shall be padded by means of wood blocks or other suitable material where they pass over sharp edges or corners of loads so as to prevent cutting or kinking.

(6) Skips shall be rigged to be handled by not less than 3 legged bridles, and all legs shall always be used. When open end skips are used, means shall be taken to prevent the contents from falling.

(7) Loose ends of idle legs of slings in use shall be hung on the hook.

(8) Employees shall not be permitted to ride the hook or the load.

(9) Loads (tools, equipment or other materials) shall not be hung or suspended over the heads of employees.

(10) Pieces of equipment or structure susceptible to falling or dislodgement shall be secured or removed as early as possible.

(11) An individual who is familiar with the signal code in use shall be assigned to act as a signalman when the hoist operator cannot see the load being handled. Communications shall be made by means of clear and distinct visual or auditory signals except that verbal signals shall not be permitted.

(12) Pallets, when used, shall be of such material and construction and so maintained as to safely support and carry the loads being handled on them.

(13) A section of hatch through which materials or equipment are being raised, lowered, moved, or otherwise shifted manually or by a crane, winch, hoist, or derrick, shall

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be completely opened. The beam or pontoon left in place adjacent to an opening shall be sufficiently lashed, locked or otherwise secured to prevent it from moving so that it cannot be displaced by accident.

(14) Hatches shall not be opened or closed while employees are in the square of the hatch below.

(15) Before loads or empty lifting gear are raised, lowered, or swung, clear and sufficient advance warning shall be given to employees in the vicinity of such operations.

(16) At no time shall an employee be permitted to place himself in hazardous position between a swinging load and a fixed object.

**TABLE E-1**  
DIMENSIONS AND SPACING OF WOOD  
INDEPENDENT-POLE SCAFFOLD MEMBERS

Structural Members	Light duty (Up to 25 pounds per square foot)			Heavy duty (25 to 75 pounds per square foot)		
	Height in feet			Height in feet		
	<24	>24<40	40<60	<24	>24<40	40<60
Poles or uprights (in inches) . . . . .	2x4	3x4 or 2x6	4x4	3x4	4x4	4x6
Bearers (in inches) . . . . .	2x4	2x6	2x6	2x8	2x8	2x10
Ledgers (in inches) . . . . .	2x6	2x6	2x6	2x8	2x8	2x8
Stringer (not supporting bearers) (in inches) . . . . .	1x6	1x6	1x6	1x6	1x6	1x6
Braces (in inches) . . . . .	1x4	1x6	1x6	1x6	1x6	1x6
Pole spacing—longitudinally (in feet) . . . . .	7 1/2	7 1/2	7 1/2	7	7	7
Pole spacing—transversely (in feet) . . . . .	6 1/2 min	7 1/2 min	8 1/2 min	6 1/2	10	10
Ledger spacing—vertically (in feet) . . . . .	7	7	7	4 1/2	4 1/2	4 1/2

**TABLE E-2**  
SPECIFICATIONS FOR SIDE RAILS OF LADDERS

Length (in feet)	Cross section (in inches)	
	At ends	At center
15 . . . . .	1 7/8 x 2 3/4	1 7/8 x 3 3/4
16 . . . . .	1 7/8 x 2 3/4	1 7/8 x 3 3/4
17 . . . . .	1 7/8 x 3	1 7/8 x 4
18 . . . . .	1 7/8 x 3	1 7/8 x 4
20 . . . . .	1 7/8 x 3	1 7/8 x 4 1/2
24 . . . . .	1 7/8 x 3	1 7/8 x 4 1/2

**TABLE E-3**  
SPECIFICATIONS FOR THE CONSTRUCTION OF HORSES

Structural Members	Height in feet		
	<10 Inches	>10<16 Inches	16<20 Inches
Legs . . . . .	2x4	3x4	4x6
Bearers or headers . . . . .	2x6	2x8	4x6
Crossbraces . . . . .	2x4	2x4	2x6
Longitudinal braces . . . . .	or 1x8 2x4	2x6	2x6

**TABLE E-4**  
SAFE CENTER LOADS FOR SCAFFOLD PLANK  
OF 1,100 POUNDS FIBRE STRESS

[Codification note: The graphic presentation of this table has been varied in order that it would fall within the printing specifications for the Washington Administrative Code. The following table had lumber dimensions in the

table heading typed in vertically across the page while the remainder of the table was typed horizontally on the page. The "Span in Feet" materials (6 through 16) which ran top to bottom has been switched to run left to right on the page. The "Lumber dimensions in inches" which ran left to right on the page has been switched to run top to bottom on the page.]

Lumber dimensions in inches	Span in Feet					
	6	8	10	12	14	16
A-2 x 10						
B-1 5/8 x 9 1/2	256	192	153	128	110	—
A-2 x 12						
B-1 5/8 x 11 1/2	309	232	186	155	133	116
A-3 x 8						
B-2 5/8 x 7 1/2	526	395	316	263	225	197
A-3 x 10						
B-2 5/8 x 9 1/2	667	600	400	333	286	250
A-3 x 12						
B-2 5/8 x 11 1/2	807	605	484	404	346	303

(A)—Rough lumber.  
(B)—Dressed lumber.

**TABLE G-1**  
MANILA ROPE  
(in pounds or tons of 2000 pounds)

Circumference	Dia-meter in Inches	Single Leg	60°	45°	30°
3/4	1/4	120 lbs.	204 lbs.	170 lbs.	120 lbs.
1	5/16	200	346	282	200
1-1/8	3/8	270	467	380	270
1-1/4	7/16	350	605	493	350
1-3/8	15/32	450	775	635	450
1-1/2	1/2	530	915	798	530
1-3/4	9/16	690	1190	973	690
2	5/8	880	1520	1240	880
2-1/4	3/4	1080	1870	1520	1080
2-1/2	13/16	1300	2250	1830	1300
2-3/4	7/8	1540	2660	2170	1540
3	1	1800	3120	2540	1800
3-1/4	1-1/16	1.0 tons	1.7 tons	1.4 tons	1.0 tons
3-1/2	1-1/8	1.2	2.1	1.7	1.2
3-3/4	1-1/4	1.35	2.3	1.9	1.35
4	1-5/16	1.5	2.6	2.1	1.5
4-1/2	1-1/2	1.8	3.1	2.5	1.8
5	1-5/8	2.25	3.9	3.2	2.25
5-1/2	1-3/4	2.6	4.5	3.7	2.6
6	2	3.1	5.4	4.4	3.1
6-1/2	2-1/8	3.6	6.2	5.1	3.6

**TABLE G-2**  
RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE AND WIRE ROPE SLINGS  
(in tons of 2000 pounds)

Rope Dia. Inches	SINGLE LEG					
	Vertical			Choker		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4"	.59	.56	.53	.44	.42	.40
3/8"	1.3	1.2	1.1	.98	.93	.86
1/2"	2.3	2.2	2.0	1.7	1.6	1.5
5/8"	3.6	3.4	3.0	2.7	2.5	2.2
3/4"	5.1	4.9	4.2	3.8	3.6	3.1
7/8"	6.9	6.6	5.5	5.2	4.9	4.1
1"	9.0	8.5	7.2	6.7	6.4	5.4
1-1/8"	11.0	10.0	9.0	8.5	7.8	6.8
6X37 CLASSIFICATION						
1-1/4"	13.	12.	10.	9.9	9.2	7.9

Rope Dia. Inches	SINGLE LEG					
	Vertical			Choker		
	A	B	C	A	B	C
1-3/8"	16.	15.	13.	12.	11.	9.6
1-1/2"	19.	17.	15.	14.	13.	11.
1-3/4"	26.	24.	20.	19.	18.	15.
2"	33.	30.	26.	25.	23.	20.
2-1/4"	41.	38.	33.	31.	29.	25.

(A) - Socket or swaged terminal attachment  
(B) - Mechanical sleeve attachment.  
(C) - Hand tucked splice attachment.

**TABLE G-3**  
RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE SLINGS  
(in tons of 2000 pounds)

[Codification note: The graphic presentation of this table has been varied slightly in order that it would fall within the printing specifications for the Washington Administrative Code. The following table was too wide to be accommodated in the width of the WAC column. The table as codified has been divided into two tables covering the "TWO—LEG BRIDLE OR BASKET HITCH" for 6x19 Classification and for 6x37 Classification. Part One has Rope Diameter in Inches for Vertical and 60° within the two classifications. Part Two has Rope Diameter in Inches for 45° and 30° within the two classifications.]

**TWO - LEG BRIDLE OR BASKET HITCH**  
(TABLE G-3: Part 1—Vertical and 60° Positions)

Rope Dia. Inches	Vertical					
	60°			60°		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4"	1.2	1.1	1.0	1.0	.97	.92
3/8"	2.6	2.5	2.3	2.3	2.1	2.0
1/2"	4.6	4.4	3.9	4.0	3.8	3.4
5/8"	7.2	6.8	6.0	6.2	5.9	5.2
3/4"	10.	9.7	8.4	8.9	8.4	7.3
7/8"	14.	13.	11.	12.	11.	9.6
1"	18.	17.	14.	15.	15.	12.
1-1/8"	23.	21.	18.	19.	18.	16.
6X37 CLASSIFICATION						
1-1/4"	26.	24.	21.	23.	21.	18.
1-3/8"	32.	29.	25.	28.	25.	22.
1-1/2"	38.	35.	30.	33.	30.	26.
1-3/4"	51.	47.	41.	44.	41.	35.
2"	66.	61.	53.	57.	53.	46.
2-1/4"	83.	76.	66.	72.	66.	57.

**TWO - LEG BRIDLE OR BASKET HITCH**  
(TABLE G-3: Part 2—45° and 30° Positions)

Rope Dia. Inches	45°					
	30°			30°		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4"	.83	.79	.75	.59	.56	.53
3/8"	1.8	1.8	1.6	1.3	1.2	1.1
1/2"	3.2	3.1	2.8	2.3	2.2	2.0
5/8"	5.1	4.8	4.2	3.6	3.4	3.0
3/4"	7.2	6.9	5.9	5.1	4.9	4.2
7/8"	9.8	9.3	7.8	6.9	6.6	5.5
1"	13.	12.	10.	9.0	8.5	7.2
1-1/8"	16.	15.	13.	11.	10.	9.0
6X37 CLASSIFICATION						
1-1/4"	19.	17.	15.	13.	12.	10.
1-3/8"	22.	21.	18.	16.	15.	13.
1-1/2"	27.	25.	21.	19.	17.	15.
1-3/4"	36.	33.	29.	26.	24.	20.
2"	47.	43.	37.	33.	30.	26.

2-1/4"	58.	54.	47.	41.	38.	33.
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(A) - Socket or swaged terminal attachment.  
 (B) - Mechanical sleeve attachment.  
 (C) - Hand tucked splice attachment.

**TABLE G-4**  
 RATED CAPACITIES FOR  
 IMPROVED PLOW STEEL,  
 FIBER CORE, WIRE ROPE AND  
 WIRE ROPE SLINGS  
 (in tons of 2000 pounds)

SINGLE LEG						
Rope Dia. Inches	Vertical			Choker		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4	.55	.51	.49	.41	.38	.37
3/8	1.2	1.1	1.1	.91	.85	.80
1/2	2.1	2.0	1.8	1.6	1.5	1.4
5/8	3.3	3.1	2.8	2.5	2.3	2.1
3/4	4.8	4.4	3.9	3.6	3.3	2.9
7/8	6.4	5.9	5.1	4.8	4.5	3.9
1	8.4	7.7	6.7	6.3	5.8	5.0
1-1/8	10.	9.5	8.4	7.9	7.1	6.3
6X37 CLASSIFICATION						
1-1/4	12.	11.	9.8	9.2	8.3	7.4
1-3/8	15.	13.	12.	11.	10.	8.9
1-1/2	17.	16.	14.	13.	12.	10.
1-3/4	24.	21.	19.	18.	16.	14.
2	31.	28.	25.	23.	21.	18.

(A) - Socket or swaged terminal attachment.  
 (B) - Mechanical sleeve attachment.  
 (C) - Hand tucked splice attachment.

**TABLE G-5**  
 RATED CAPACITIES FOR IMPROVED PLOW  
 STEEL, FIBER CORE, WIRE ROPE SLINGS  
 (in tons of 2000 pounds)

[Codification note: The graphic presentation of this table has been varied slightly in order that it would fall within the printing specifications for the Washington Administrative Code. The following table was too wide to be accommodated in the width of the WAC column. The table as codified has been divided into two tables covering the "TWO - LEG BRIDLE OR BASKET HITCH" for 6x19 Classification and for 6x37 Classification. Part One has Rope Diameter in Inches for Vertical and 60° within the two classifications. Part Two has Rope Diameter in Inches for 45° and 30° within the two classifications.]

**TWO - LEG BRIDLE OR BASKET HITCH**  
 (TABLE G-5: Part 1—Vertical and 60° Positions)

Rope Dia. Inches	Vertical			60°		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4	1.1	1.0	.99	.95	.88	.85
3/8	2.4	2.2	1.9	2.1	1.9	1.8
1/2	4.3	3.9	3.7	3.7	3.4	3.2
5/8	6.7	6.2	5.6	5.8	5.3	4.8
3/4	9.5	8.8	7.8	8.2	7.6	6.8
7/8	13.	12.	10.	11.	10.	8.9
1	17.	15.	13.	14.	13.	11.
1-1/8	21.	19.	17.	18.	16.	14.
6X37 CLASSIFICATION						
1-1/4	25.	22.	20.	21.	19.	17.
1-3/8	30.	27.	24.	26.	23.	20.
1-1/2	35.	33.	28.	30.	27.	24.
1-3/4	48.	43.	38.	41.	37.	33.
2	62.	55.	49.	53.	48.	43.

**TWO - LEG BRIDLE OR BASKET HITCH**  
 (TABLE G-5: Part 2—45° and 30° Positions)

Rope Dia. Inches	45°			30°		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4	.77	.72	.70	.55	.51	.49
3/8	1.7	1.6	1.5	1.2	1.1	1.1
1/2	3.0	2.8	2.6	2.1	2.0	1.8
5/8	4.7	4.4	4.0	3.3	3.1	2.8
3/4	6.7	6.2	5.5	4.8	4.4	3.9
7/8	9.1	8.4	7.3	6.4	5.9	5.1
1	12.	11.	9.4	8.4	7.7	6.7
1-1/8	15.	13.	12.	10.	9.5	8.4
6X37 CLASSIFICATION						
1-1/4	17.	16.	14.	12.	11.	9.8
1-3/8	21.	19.	17.	15.	13.	12.
1-1/2	25.	22.	20.	17.	16.	14.
1-3/4	34.	30.	27.	24.	21.	19.
2	43.	39.	35.	31.	28.	25.

(A) - Socket or swaged terminal attachment.  
 (B) - Mechanical sleeve attachment.  
 (C) - Hand tucked splice attachment.

**TABLE G-6**  
 NUMBER AND SPACING OF U-BOLT WIRE  
 ROPE CLIPS

Improved plow steel rope diameter inches	Number of Clips			Minimum spacing (inches)
	Drop forged	Other material		
*	...	...		
1/2	3	4		3
5/8	3	4		3 3/4
3/4	4	5		4 1/2
7/8	4	5		5 1/4
1	4	6		6
1 1/8	5	6		6 3/4
1 1/4	5	7		7 1/2
1 3/8	6	7		8 1/4
1 1/2	6	8		9

\*Three clips shall be used on wire size less than 1/2-inch diameter.

**TABLE G-7**  
 WROUGHT IRON CHAIN  
 (in pounds or tons of 2000 pounds)

Nominal Size Chain Stock Inch	Single Leg	60°	45°	30°
* 1/4	1060	1835	1500	1060
* 5/16	1655	2865	2340	1655
3/8	2385	2.1	3370	2385
* 7/16	3250	2.8	2.3	3250
1/2	12.1	13.7	13.0	12.1
* 9/16	12.7	14.6	13.8	12.7
5/8	13.3	15.7	14.7	13.3
3/4	14.8	18.3	16.7	14.8
7/8	16.5	11.2	19.2	16.5
1	18.5	14.7	12.0	18.5
1- 1/8	10.0	17.3	14.2	10.0
1- 1/4	12.4	21.4	17.5	12.4
1- 3/8	15.0	25.9	21.1	15.0
1- 1/2	17.8	30.8	25.2	17.8
1- 5/8	20.9	36.2	29.5	20.9
1- 3/4	24.2	42.0	34.3	24.2
1- 7/8	27.6	47.9	39.1	27.6
2	31.6	54.8	44.8	31.6

\*These sizes of wrought iron chain are no longer manufactured in the United States.

**TABLE G-8**  
ALLOY STEEL CHAIN  
(in tons of 2000 pounds)

Nominal Size Chain Stock Inch	Single Leg	60°	45°	30°
1/4	1.62	2.82	2.27	1.62
3/8	3.30	5.70	4.65	3.30
1/2	5.62	9.75	7.90	5.62
5/8	8.25	14.25	11.65	8.25
3/4	11.5	19.9	16.2	11.5
7/8	14.3	24.9	20.3	14.3
1	19.3	33.4	27.3	19.8
1-1/8	22.2	38.5	31.5	22.2
1-1/4	28.7	49.7	40.5	28.7
1-3/8	33.5	58.0	47.0	33.5
1-1/2	39.7	68.5	56.0	39.7
1-5/8	42.5	73.5	59.5	42.5
1-3/4	47.0	81.5	62.0	47.0

**TABLE G-9**  
MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain size in inches	Maximum allowable wear in fraction of inches
1/4 (9/32)	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	1/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	1/32

**TABLE G-10**  
SAFE WORKING LOADS FOR SHACKLES  
(in tons of 2,000 pounds)

Material size (inches)	Pin diameter (inches)	Safe working load
1/2	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/8	5.6
1 1/8	1 1/4	6.7
1 1/4	1 3/8	8.2
1 3/8	1 1/2	10.0
1 1/2	1 5/8	11.9
1 3/4	2	16.2
2	2 1/4	21.2

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-04-099, § 296-304-07011, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-07011, filed 5/7/74.]

**WAC 296-304-07013 Qualifications of operators.** (1) When ship's gear is used to hoist materials aboard, a competent person shall determine that the gear is properly rigged,

that it is in safe condition, and that it will not be overloaded by the size and weight of the lift.

(2) Only those employees who understand the signs, notices, and operating instructions, and are familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power operated hoisting apparatus.

(3) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate him, shall be permitted to operate a crane, winch or other power operated hoisting apparatus.

(4) No minor under eighteen years of age shall be employed in occupations involving the operation of any power-driven hoisting apparatus or assisting in such operations by work such as hooking on, loading slings, rigging gear, etc.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-04-099, § 296-304-07013, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-07013, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-07013, filed 5/7/74.]

**WAC 296-304-080 Tools and related equipment— Scope and application.** All sections of this chapter which include WAC 296-304-080 in the section number apply to tools and related equipment.

[Order 74-25, § 296-304-080, filed 5/7/74.]

**WAC 296-304-08001 General precautions.** (1) Hand lines, slings, tackles of adequate strength, or carriers such as tool bags with shoulder straps shall be provided and used to handle tools, materials, and equipment so that employees will have their hands free when using ship's ladders and access ladders. The use of hose or electric cords for this purpose is prohibited.

(2) When air tools of the reciprocating type are not in use, the discs and tools shall be removed.

(3) All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

(4) The moving parts of machinery on dry docks shall be guarded.

(5) Before use, pneumatic tools shall be secured to the extension hose or whip by some positive means to prevent the tool from becoming accidentally disconnected from the whip.

(6) The moving parts of drive mechanisms, such as gearing and belting on large portable tools, shall be adequately guarded.

(7) Headers, manifolds, and widely spaced hose connections on compressed air lines shall bear the word "air" in letters at least 1 inch high, which shall be painted either on the manifolds or separate hose connections, or on signs permanently attached to the manifolds or connections. Grouped air connections may be marked in one location.

(8) Before use, compressed air hose shall be examined. Visibly damaged and unsafe hose shall not be used.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-08001, filed 2/4/03, effective 8/1/03; Order 76-7, § 296-304-08001, filed 3/1/76; Order 74-25, § 296-304-08001, filed 5/7/74.]

**WAC 296-304-08003 Portable electric tools.** (1) The frames of portable electric tools and appliances, except double insulated tools approved by Underwriters' Laboratories, shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current.

(2) Grounding circuits, other than by means of the structure of the vessel on which the tool is being used, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance which is low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(3) Portable electric tools which are held in the hand shall be equipped with switches of a type which must be manually held in the closed position.

(4) Worn or frayed electric cables shall not be used.

(5) The employer shall notify the officer in charge of the vessel before using electric power tools operated with the vessel's current.

[Order 74-25, § 296-304-08003, filed 5/7/74.]

**WAC 296-304-08005 Hand tools.** (1) Employers shall not issue or permit the use of unsafe hand tools.

(2) Wrenches, including crescent, pipe, end and socket wrenches, shall not be used when jaws are sprung to the point that slippage occurs.

(3) Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

(4) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

[Order 74-25, § 296-304-08005, filed 5/7/74.]

**WAC 296-304-08007 Abrasive wheels.** (1) Floor stand and bench mounted abrasive wheels used for external grinding shall be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel periphery and sides shall be not more than 90 degrees, except that when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125 degrees. In either case the exposure shall begin not more than 65 degrees above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the effect of a bursting wheel.

(2) Floor and bench mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be kept a distance not to exceed 1/8 inch from the surface of the wheel.

(3) Cup type wheels use for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the United States of American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1.1970. All other portable abrasive wheels used for external grinding shall be provided

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with safety guards (protection hoods) meeting the requirements of (5) of this section, except as follows:

(a) When the work location makes it impossible, in which case a wheel equipped with safety flanges as described in (6) of this section shall be used.

(b) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

(4) Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) meeting the requirements of (6) of this section, except as follows:

(a) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

(b) If the wheel is entirely within the work being ground while in use.

(5) When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180 degrees.

(6) When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges of a type and design and properly assembled so as to insure that the pieces of the wheel will be retained in case of accidental breakage shall be used.

(7) All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects.

(8) Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.

(9) The power supply shall be sufficient to maintain the rated spindle speed under all conditions of normal grinding. The rated maximum speed of the wheel shall not be exceeded.

(10) The employer must ensure that all employees using abrasive wheels are protected by eye protection equipment that meets the requirements of WAC 296-304-09005 (1) and (2), except when adequate eye protection is provided by eye shields permanently attached to the bench or floor stand.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-08007, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-08007, filed 5/7/74.]

**WAC 296-304-08009 Powder-actuated fastening tools.** (1) The employer must ensure powder-actuated fastening tools are used, designed, constructed, and maintained according to the requirements of WAC 296-24-663, Safety requirements for powder-actuated fastening systems.

(2) The employer must ensure that employees using powder-actuated fastening tools are protected by personal protective equipment that meets the requirements of WAC 296-304-09005 (1) and (2). The employer must also meet the requirements of chapter 296-817 WAC, Hearing loss prevention (noise).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-304-08009, filed 5/19/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-08009, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-08009, filed 1/18/95, effective 3/10/95;

Order 76-7, § 296-304-08009, filed 3/1/76; Order 74-25, § 296-304-08009, filed 5/7/74.]

**WAC 296-304-08011 Internal combustion engines, other than ship's equipment.** (1) When internal combustion engines, furnished by the employer are used in a fixed position below decks, for such purposes as driving pumps, generators, and blowers, the exhaust shall be led to the open air, clear of any ventilation intakes and openings through which it might enter the vessel

(2) All exhaust line joints and connections shall be checked for tightness immediately upon starting the engine, and any leaks shall be corrected at once.

(3) When internal combustion engines on vehicles, such as forklifts and mobile cranes, or on portable equipment such as fans, generators, and pumps exhaust into the atmosphere below decks, the competent person shall make tests of the carbon monoxide content of the atmosphere as frequently as conditions require to ensure that dangerous concentrations do not develop. Employees shall be removed from the compartment involved when the carbon monoxide concentration exceeds 50 parts per million (0.005%). The employer shall use blowers sufficient in size and number and so arranged as to maintain the concentration below this allowable limit before work is resumed.

[Order 74-25, § 296-304-08011, filed 5/7/74.]

**WAC 296-304-090 Personal protective equipment (PPE)—General requirements.** The employer must provide and ensure that each affected employee uses the appropriate personal protective equipment (PPE) for the eyes, face, head, extremities, torso, and respiratory system, including protective clothing, protective shields, hearing protection, protective barriers, personal fall protection equipment, and life saving equipment, wherever the employee is exposed to hazards that require the use of PPE. The employer must furnish the personal protective equipment at no cost to employees if:

- The intended purpose is to protect against hazardous materials (the PPE may be contaminated by hazardous materials in the course of employment); or
- The PPE is of such a nature that it would not reasonably be worn outside the worksite.

The provision of personal protective equipment which may reasonably be worn outside of the workplace is subject to labor-management negotiations, but the employer must ensure that exposed employees are wearing the appropriate PPE.

Examples of PPE that must be provided at no cost to employees include but are not limited to:

- Boots worn to protect against chemicals;
- Nonprescription protective eye wear;
- Goggles to fit over prescription eye wear;
- Metatarsal protection;
- Full body harnesses and lanyards.

Examples of PPE that provision is subject to labor-management negotiation include but are not limited to:

- Leather boots with or without steel toes;
- Coats to protect against inclement weather;
- Prescription protective eye wear (except as part of a full facepiece or hooded respirator).

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-090, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-090, filed 5/7/74.]

**WAC 296-304-09001 Hazard assessment and equipment selection.** (1) The employer must assess its work activity to determine if hazards that require the use of personal protective equipment (PPE) are present, or are likely to be present.

(a) If such hazards are present, or likely to be present, the employer must:

(i) Select, and require each affected employee to use, PPE that will protect the employee from the hazards identified in the hazard assessment;

(ii) Inform the affected employee what types of PPE to use;

(iii) Select PPE that properly fits the affected employee; and

(iv) Verify that the hazard assessment has been performed through a document that contains the following information:

- Work activity evaluated;
- Occupation;
- Date(s) of the hazard assessment; and
- The name of the person performing the hazard assessment.

Note: A hazard assessment conducted according to the trade or occupation of affected employees will be considered to comply with this requirement if it addresses all PPE - related hazards to which employees are exposed in the course of their work activities.

(2) The employer must ensure that employees do not use defective or damaged PPE.

(3) The employer must ensure that all unsanitary PPE, including all previously used PPE, is cleaned and disinfected before it is reissued.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09001, filed 12/26/97, effective 3/1/98; Order 76-7, § 296-304-09001, filed 3/1/76; Order 74-25, § 296-304-09001, filed 5/7/74.]

**WAC 296-304-09003 Training.** The employer must provide training to each employee for whom PPE is required by this section.

(1) Each employee whose work activities require the use of PPE must be trained to know at least the following:

(a) When PPE is necessary;

(b) What PPE is necessary;

(c) How to properly put on, take off, adjust, and wear PPE;

(d) The limitations of the PPE; and

(e) The proper care, maintenance, useful life and disposal of the PPE.

(2) The employer must ensure that each affected employee demonstrates the ability to use PPE properly before being allowed to perform work where its use is required.

(3) The employer must retrain any employee who does not understand or display the skills required by subsection (2) of this section. Circumstances where retraining is required include, but are not limited to, situations where:

(a) Changes in occupation or work make previous training obsolete; or

(b) Changes in the types of PPE to be used make previous training obsolete; or

(c) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the understanding or skill.

(4) The employer must verify that each affected employee has received the required training through a document that contains the following information:

- Name of each employee trained;
- Date(s) of training; and
- Type of training the employee received.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09003, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-304-09003, filed 9/22/93, effective 11/1/93. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-304-09003, filed 11/30/83; Order 74-25, § 296-304-09003, filed 5/7/74.]

**WAC 296-304-09005 Eye and face protection.** (1) The employer must provide each affected employee with eye and face protection according to the following requirements:

(a) Each affected employee must use appropriate eye or face protection when exposed to eye or face hazards caused by flying particles, molten metal, liquid chemicals, acid or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

(b) Each affected employee must use eye or face protection that provides side protection when there is a hazard from flying objects. A detachable side protector (e.g., a clip-on or slide-on side shield) that meets the requirements of this section is acceptable.

(c) Each affected employee who wears prescription lenses must:

- Use eye protection that incorporates the prescription in its design; or
- Be protected by eye protection that can be worn over prescription lenses without disturbing the proper position of either the PPE or the prescription lenses.

(d) Each affected employee must use equipment with filter lenses of a shade that provides appropriate protection from injurious light radiation. Tables I-1A and I-1B lists the appropriate shade numbers for various operations. If filter lenses are used in goggles worn under a helmet with a lens, the shade number of the lens in the helmet may be reduced so that the shade numbers of the two lenses will equal the value shown in the Tables I-1A and I-1B.

(2) The employer must ensure that all protective eye and face devices meet the following criteria:

(a) Protective eye and face devices purchased after February 20, 1995, comply with the American National Standards Institute, ANSI Z87.1-1989, "Practice for Occupational and Educational Eye and Face Protection," or the employer demonstrates that the devices are equally effective.

(b) Eye and face protective devices purchased before February 20, 1995, comply with "American National Standard Practice for Occupational and Educational Eye and Face Protection, Z87.1-1979," or the employer demonstrates that the devices are equally effective.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09005, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-09005, filed 5/7/74.]

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**WAC 296-304-09007 Respiratory protection.** The employer must provide respiratory protection that meets the requirements of chapter 296-842 WAC, Respirators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-055, § 296-304-09007, filed 10/3/05, effective 12/1/05; 05-03-093, § 296-304-09007, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09007, filed 12/26/97, effective 3/1/98; Order 76-7, § 296-304-09007, filed 3/1/76; Order 74-25, § 296-304-09007, filed 5/7/74.]

**WAC 296-304-09009 Hearing protection.** The employer must meet the requirements of chapter 296-817 WAC, Hearing loss prevention (noise).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-304-09009, filed 5/19/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09009, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-09011 Head protection.** (1) The employer must provide each affected employee with head protection according to the following requirements:

(a) Each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head.

(b) Each affected employee wears a protective helmet designed to reduce electrical shock hazards where there is potential for electric shock or burns from contact with exposed electrical conductors that could contact the head.

(2) The employer must ensure that all protective helmets meet the following criteria:

(a) Protective helmets purchased before February 20, 1995, comply with the "American National Standard Safety Requirements for Industrial Head Protection, Z89.1-1969," or the employer demonstrates that they are equally effective.

(b) Protective helmets purchased after February 20, 1995, comply with ANSI Z89.1-1986, "Personnel Protection—Protective Headwear for Industrial Workers—Requirements," or the employer demonstrates that they are equally effective.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09011, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-09013 Foot protection.** (1) The employer must ensure that each affected employee wears protective footwear when working in areas where:

- There is a danger of foot injuries from falling or rolling objects;
- There is a danger of foot injuries from objects piercing the sole; or
- Where an employee's feet are exposed to electrical hazards.

(2) The employer must ensure that all protective footwear meets the following criteria:

(a) Protective footwear purchased before February 20, 1995, complies with the ANSI standard "USA Standard for Men's Safety-Toe Footwear," ANSI Z41-1983, or the employer demonstrates that footwear is equally effective.

(b) Protective footwear purchased after February 20, 1995, complies with ANSI Z41-1991, "American National Standard for Personal Protection—Protective Footwear," or the employer demonstrates that footwear is equally effective.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09013, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-09015 Hand and body protection.** The employer must ensure that each affected employee uses appropriate hand protection and other protective clothing where there is exposure to hazards such as:

- Skin absorption of harmful substances;
- Severe cuts or lacerations;
- Severe abrasions;
- Punctures;
- Chemical burns;
- Thermal burns;
- Harmful temperature extremes; and
- Sharp objects.

(1) Hot work operations. The employer must ensure that an employee's clothing is free from flammable or combustible materials (such as grease or oil) while engaged in hot work operations or working near an ignition or oxygen source.

(2) Electrical protective devices. The employer must ensure that each affected employee wears protective electrical insulating gloves and sleeves or other electrical protective equipment, if that employee is exposed to electrical shock hazards while working on electrical equipment.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09015, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-09017 Lifesaving equipment.** (1) Personal flotation devices (PFD).

• You must provide your employees with PFDs approved by the United States Coast Guard for use on commercial or merchant vessels. The following are appropriate or allowable United States Coast Guard approved PFDs:

Type of PFD	General Description
Type I	Off-shore life jacket - effective for all waters or where rescue may be delayed.
Type II	Near-shore buoyant vest - intended for calm, inland water or where there is a good chance of quick rescue.
Type III	Flotation aid - good for calm, inland water, or where there is a good chance of rescue.
Type V	Flotation aids such as board-sailing vests, deck suits, work vests and inflatable PFDs marked for commercial use.

- Note:
- Commercially available PFDs are marked or imprinted with the Type of PFD.
  - Type IV PFDs are throwable devices. They are used to aid persons who have fallen into the water.
  - The requirements for USCG approval are in 46 CFR Part 160, Coast Guard Lifesaving Equipment Specifications.

The employer must ensure that each personal flotation device is inspected before use for dry rot, chemical damage,

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or other defects that may affect its strength and buoyancy. Defective personal floatation devices shall not be used.

(2) Ring life buoys and ladders.

(a) The employer must ensure that when work is performed on a floating vessel 200 feet (61 m) or more in length, at least three 30-inch (0.76 m) U.S. Coast Guard approved ring life buoys with lines attached are located in readily visible and accessible places. Ring life buoys must be located one forward, one aft, and one at the access to the gangway.

(b) On floating vessels under 200 feet (61 m) in length, at least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with line attached must be located at the gangway.

(c) At least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with a line attached must be located on each staging alongside of a floating vessel on which work is performed.

(d) At least 90 feet (27.43 m) of line must be attached to each ring life buoy.

(e) There must be at least one portable or permanent ladder near each floating vessel on which work is performed. The ladder must be long enough to help an employee reach safety in the event of a fall into the water.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-04-099, § 296-304-09017, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09017, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-09019 Fall protection—General requirement.** The employer must provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09019, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-09021 Personal fall arrest systems (PFAS).** Personal fall arrest systems must meet the requirements of this section.

(1) The employer must ensure that connectors and anchorages meet the following criteria:

(a) Connectors are made of drop forged, pressed, or formed steel or of materials with equivalent strength.

(b) Connectors have a corrosion-resistant finish, and all surfaces and edges are smooth to prevent damage to the interfacing parts of the system.

(c) D-rings and snaphooks can sustain a minimum tensile load of 5,000 pounds (22.24 Kn).

(d) D-rings and snaphooks are proof-tested to a minimum tensile load of 3,600 pounds (16 Kn) without cracking, breaking, or being permanently deformed.

(e) Snaphooks lock and are designed and used to prevent disengagement of the snaphook by contact of the snaphook keeper with the connected part.

(f) On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used for connection to the horizontal lifeline can lock in any direction on the lifeline.

(g) Anchorages used for attachment of personal fall arrest equipment are independent of any anchorage used to support or suspend platforms.

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(h) Anchorages can support at least 5,000 pounds (22.24 Kn) per employee attached, or are designed, installed, and used as follows:

(i) As part of a complete personal fall arrest system that maintains a safety factor of at least two; and

(ii) Under the direction and supervision of a qualified person.

(2) The employer must ensure that lifelines, lanyards, and personal fall arrest systems meet the following criteria:

(a) When vertical lifelines are used, each employee has a separate lifeline.

(b) Vertical lifelines and lanyards have a minimum tensile strength of 5,000 pounds (22.24 Kn).

(c) Self-retracting lifelines and lanyards that automatically limit free fall distances to 2 feet (0.61 m) or less can sustain a minimum tensile load of 3000 pounds (13.34 Kn) applied to a self-retracting lifeline or lanyard with the lifeline or lanyard in the fully extended position.

(d) Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, ripstitch lanyards and tearing and deforming lanyards can sustain a minimum static tensile load of 5,000 pounds (22.24 Kn) applied to the device when they are in the fully extended position.

(e) Horizontal lifelines are designed, installed, and used under the supervision of a qualified person, and only used as part of a complete personal fall arrest system that maintains a safety factor of at least two.

Note: The system strength needs below are based on a maximum combined weight of employee and tools of 310 pounds. If combined weight is more than 310 pounds (140.62 kg), appropriate allowances must be made or the system will not be in compliance.

(f) Effective April 20, 1998, the employer must ensure that personal fall arrest systems:

(i) Limit the maximum arresting force on a falling employee to 1,800 pounds (8 Kn) when used with a body harness;

(ii) Bring a falling employee to a complete stop and limit the maximum deceleration distance an employee travels to 3.5 feet (1.07 m); and

(iii) Are strong enough to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system, whichever is less.

(g) The employer must ensure that personal fall arrest systems are rigged so that an employee can neither free fall more than 6 feet (1.83 m) nor contact any lower level.

(3) The employer must select, use, and care for systems and system components according to the following requirements:

(a) Lanyards are attached to employees using personal fall arrest systems, as follows:

The attachment point of a body harness is in the center of the wearer's back near the shoulder level, or above the wearer's head. If the maximum free fall distance is less than 20 inches, the attachment point may be located in the chest position.

(b) Ropes and straps (webbing) used in lanyards, lifelines and strength components of body harnesses are made from synthetic fibers or wire rope.

(c) Ropes, harnesses, and lanyards are compatible with their hardware.

(d) Lifelines and lanyards are protected against cuts, abrasions, burns from hot work operations and deterioration by acids, solvents, and other chemicals.

(e) Personal fall arrest systems are inspected before each use for mildew, wear, damage, and other deterioration. Defective components are removed from service.

(f) Personal fall arrest systems and components subjected to impact loading are immediately removed from service and not used again for employee protection until inspected and determined by a qualified persons to be undamaged and suitable for reuse.

(g) The employer must provide for prompt rescue of employees in the event of a fall or must ensure that employees are able to rescue themselves.

(h) Personal fall arrest systems and components are used only for employee fall protection and not to hoist materials.

(4) Training. Before using personal fall arrest equipment, the employer must ensure that each affected employee is trained to understand the application limits of the equipment and proper hook-up, anchoring, and tie-off techniques. Affected employees must also be trained to demonstrate the proper use, inspection, and storage of their equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-09021, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09021, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-09023 Positioning device systems.** The employer must ensure that positioning device systems and their use meet the requirements of this section.

(1) The employer must ensure that connectors and anchorages meet the following criteria:

(a) Connectors have a corrosion-resistant finish, and all surfaces and edges are smooth to prevent damage to interfacing parts of this system.

(b) Connecting assemblies have a minimum tensile strength of 5,000 pounds (22.24 Kn).

(c) Positioning device systems are secured to an anchorage that can support at least twice the potential impact load of an employee's fall.

(d) Only locking type snaphooks are used in positioning device systems.

(2) The employer must ensure that positioning device systems meet the following criteria:

(a) Restraint (tether) lines have a minimum breaking strength of 3,000 pounds (13.34 Kn).

(b) Beginning April 20, 1998, the following system performance criteria for positioning device systems are met:

(i) A window cleaner's positioning system can withstand without failure, a drop test consisting of a 6-foot (1.83 m) drop of a 250-pound (113.34 kg) weight. The system limits the initial arresting force to a maximum of 2,000 pounds (8.89 Kn), with a maximum duration of 2 milliseconds. The system limits any subsequent arresting forces imposed on the falling employee to a maximum of 1,000 pounds (4.45 Kn);

(ii) All other positioning device systems can withstand without failure a drop test consisting of a 4-foot (1.22 m) drop of a 250-pound (113.34 kg) weight.

(3) The employer must ensure that a positioning device system is used and cared for according to the following requirements:

(a) Positioning device systems are inspected before each use for mildew, wear, damage, and other deterioration. Defective components are removed from service.

(b) A positioning device system or component subjected to impact loading is immediately removed from service and not used again for employee protection, unless inspected and determined by a qualified person to be undamaged and suitable for reuse.

(4) Training. Before using a positioning device system, the employer must ensure that employees are trained in the application limits, proper hook-up, anchoring and tie-off techniques, methods of use, inspection, and storage of positioning device systems.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-09023, filed 2/4/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09023, filed 12/26/97, effective 3/1/98.]

**WAC 296-304-100 Ship's machinery and piping systems—Scope and application.** All sections of this chapter which include WAC 296-304-100 in this section number apply to ship's machinery and piping systems and sections WAC 296-304-10001 to 296-304-10007 apply only to ship-building and ship repairing.

[Order 74-25, § 296-304-100, filed 5/7/74.]

**WAC 296-304-10001 Ship's boilers.** (1) Before work is performed in the fire, steam, or water spaces of a boiler where employees may be subject to injury from the direct escape of a high temperature medium, such as steam, or water, oil, or other medium at a high temperature entering from an interconnecting system, the employer shall insure that the following steps are taken:

(a) The isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, blanked, and tagged indicating that employees are working in the boiler. This tag shall not be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working in the boiler, or until the work in the boiler is completed. Where valves are welded instead of bolted at least two isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, locked and tagged.

(b) Drain connections to atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.

(d) A warning sign calling attention to the fact that employees are working in the boilers shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are out of the boilers.

[Order 74-25, § 296-304-10001, filed 5/7/74.]

**WAC 296-304-10003 Ship's piping systems.** Before work is performed on a valve, fitting, or section of piping in a piping system where employees may be subject to injury from the direct escape of steam, or water, oil, or other

medium at a high temperature, the employer shall insure that the following steps are taken:

(1) The isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, blanked, and tagged indicating that employees are working on the systems. This tag shall not be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working on the system, or until the work on the system is completed. Where valves are welded instead of bolted at least two isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, locked, and tagged.

(2) Drain connections to the atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-04-099, § 296-304-10003, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-10003, filed 5/7/74.]

**WAC 296-304-10005 Ship's propulsion machinery.**

(1) Before work is performed on the main engine, reduction gear, or connecting accessories, the employer shall ensure that the following steps are taken:

(a) The jacking gear shall be engaged to prevent the main engine from turning over. A sign shall be posted at the throttle indicating that the jacking gear is engaged. This sign shall not be removed until the jacking gear can be safely disengaged.

(b) If the jacking gear is steam driven, the stop valves to the jacking gear shall be secured, locked, and tagged indicating that employees are working on the main engine.

(c) If the jacking gear is electrically driven, the circuit controlling the jacking gear shall be deenergized by tripping the circuit breaker, opening the switch or removing the fuse, whichever is appropriate. The breaker, switch, or fuse location shall be tagged indicating that employees are working on the main engine.

(2) Before the jacking engine is operated, the following precautions shall be taken:

(a) A check shall be made to ensure that all employees, equipment, and tools are clear of the engine, reduction gear, and its connecting accessories.

(b) A check shall be made to ensure that all employees, equipment and tools are free of the propeller.

(3) Before work is started on or in the immediate vicinity of the propeller, a warning sign calling attention to the fact that employees are working in that area shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are free of the propeller.

(4) Before the main engine is turned over (e.g., when warming up before departure or testing after an overhaul) a check shall be made to ensure that all employees, equipment, and tools are free of the propeller.

[Order 76-7, § 296-304-10005, filed 3/1/76; Order 74-25, § 296-304-10005, filed 5/7/74.]

**WAC 296-304-10007 Ship's deck machinery.** (1) Before work is performed on the anchor windlass or any of its attached accessories, the employer shall ensure that the following steps are taken:

(a) The devil claws (also known as chain toppers) shall be made fast to the anchor chains.

(b) The riding pawls shall be in the engaged position.

(c) In the absence of devil claws and riding pawls, the anchor chains shall be secured to a suitable fixed structure of the vessel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-04-099, § 296-304-10007, filed 2/4/03, effective 8/1/03; Order 74-25, § 296-304-10007, filed 5/7/74.]

**WAC 296-304-110 Portable, unfired pressure vessels, drums and containers, other than ship's equipment—Scope and application.** All sections of this chapter which include WAC 296-304-110 in the section number apply to portable, unfired pressure vessels, drums and containers, other than ship's equipment and WAC 296-304-11001 to 296-304-11003 applies only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-110, filed 5/7/74.]

**WAC 296-304-11001 Portable air receivers and other unfired pressure vessels.** (1) Portable, unfired pressure vessels, built after the effective date of this regulation, shall be marked and reported indicating that they have been designed and constructed to meet the standards of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Unfired Pressure Vessels, 1963. They shall be subjected to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

(2) Portable, unfired pressure vessels, not built to the code requirements of (1) of this section, and built prior to the effective date of this regulation, shall be examined quarterly by a competent person, and approved by the state boiler inspecting division. They shall be subjected yearly to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

(3) The relief valves on the portable, unfired pressure vessels in (1) and (2) of this section shall be set to the safe working pressure of the vessels, or set to the lowest safe working pressure of the systems, whichever is lower.

(4) A record of such examinations and tests made in compliance with the requirements of (1) and (2) of this section shall be maintained.

[Order 74-25, § 296-304-11001, filed 5/7/74.]

**WAC 296-304-11003 Drums and containers.** (1) Shipping drums and containers shall not be pressurized to remove their contents.

(2) A temporarily assembled pressurized piping system conveying hazardous liquids or gases shall be provided with a relief valve and by-pass to prevent rupture of the system and the escape of such hazardous liquids or gases.

(3) Pressure vessels, drums and containers containing toxic or flammable liquids or gases shall not be stored or used where they are subject to open flame, hot metal, or other sources of artificial heat.

(4) Unless pressure vessels, drums and containers of 30 gallon capacity or over containing flammable or toxic liquids or gases are placed in an out-of-the-way area where they will

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not be subject to physical injury from an outside source, barriers or guards shall be erected to protect them from such physical injury.

(5) Containers of 55 gallons or more capacity containing flammable or toxic liquid shall be surrounded by dikes or pans which enclose a volume equal to at least 25 percent of the total volume of the containers.

(6) Fire extinguishers adequate in number and suitable for the hazard shall be provided. These extinguishers shall be located in the immediate area where pressure vessels, drums and containers containing flammable liquids or gases are stored or in use. Such extinguishers shall be ready for use at all times.

[Order 74-25, § 296-304-11003, filed 5/7/74.]

**WAC 296-304-120 Electrical machinery—Electrical circuits and distribution boards.** (1) Before an employee is permitted to work on an electrical circuit, except when the circuit must remain energized for testing and adjusting, the circuit shall be deenergized and checked at the point at which the work is to be done to insure that it is actually deenergized. When testing or adjusting an energized circuit a rubber mat, duck board, or other suitable insulation shall be used underfoot where an insulated deck does not exist.

(2) Deenergizing the circuit shall be accomplished by opening the circuit breaker, opening the switch, or removing the fuse, whichever method is appropriate. The circuit breaker, switch, or fuse location shall be tagged to indicate that an employee is working on the circuit. Such tags shall not be removed nor the circuit energized until it is definitely determined that the work on the circuit has been completed.

(3) When work is performed immediately adjacent to an open-front energized board or in back of an energized board, the board shall be covered or some other equally safe means shall be used to prevent contact with any of the energized parts.

Note: WAC 296-304-120 is applicable only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-120, filed 5/7/74.]

**WAC 296-304-130 Gear certification—General provisions.** All sections of this chapter which include WAC 296-304-130 in the section number apply to gear certification.

[Order 74-25, § 296-304-130, filed 5/7/74.]

**WAC 296-304-13001 Purpose and scope.** (1) The regulations in this part implement WAC 296-304-07001 through 296-304-07013. They provide procedures and standards governing accreditation of persons by the department of labor and industries, for the purpose of certificating shore-based material handling devices, and the manner in which such certification shall be performed.

(2) Accreditation is not required, and the regulations of this part are not applicable, under the following circumstances:

(a) Persons not required to be accredited for gear certification purposes, may, nevertheless, apply for and receive accreditation by the department of labor and industries. The appropriate portions of this section shall apply to persons accredited except insofar as exemptions may be granted.

[Order 74-25, § 296-304-13001, filed 5/7/74.]

**WAC 296-304-13003 Definitions of terms.** (1) "Vessel" means every description of watercraft or other artificial contrivance used or capable of being used, as a means of transportation on water, including special-purpose floating structures not primarily designed for or used as a means of transportation on water.

(2) Except as otherwise noted, "cargo gear," as used in WAC 296-304-140 through 296-304-17023, includes that gear forming a part of a vessel's equipment which is used for the handling of cargo other than bulk liquids, but does not include gear which is used only for handling or holding hoses, handling ships' stores, handling the gangway, or boom conveyor belt systems for the self-unloading of bulk cargo vessels.

(3) With reference to equipment covered by this section.

(a) "Derrick" means—

(i) When applied to vessels' cargo handling gear, a mechanical device for lifting, including a boom which is suspended at its head by a topping lift from a mast, king post, or similar structure, controlled in the horizontal plane by vangs, and used either singly or in pairs with married falls;

(ii) When applied to shore-based material handling devices, a mechanical device intended for lifting, with or without a boom supported at its head by a topping lift from a mast, fixed A frame, or similar structure. The mast or equivalent member may or may not be supported by guys or braces. The boom, where fitted, may or may not be controlled in the horizontal plane by guys (vangs). The term includes shear legs.

(b) "Crane" means a mechanical device intended for lifting or lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. A crane may be a fixed or mobile machine.

(c) "Bulk cargo spout" means a spout, which may or may not be telescopic and may or may not have removable sections, but is suspended over the vessel from some overhead structure by wire rope or other means. Such a spout is often used with a "thrower" or "trimming machine." A grain loading spout is an example of those covered by this definition.

(d) "Bulk cargo sucker" means a pneumatic conveyor which utilizes a spout-like device, which may be adjustable vertically and/or laterally, and which is suspended over a vessel from some overhead structure by wire rope or other means. An example of an installation of this nature is the "grain sucker" used to discharge grain from barges.

(4) "Director" means the director of the department of labor and industries, or his authorized representative.

(5) "Bureau" means the Bureau of Labor Standards, U.S. Department of Labor.

(6) "Person" includes any individual, partnership, corporation, agency, association, or organization.

(7) "Competent person" means:

(a) An individual qualified to perform gear certification functions with respect to vessels' cargo handling gear, as specifically set forth in WAC 296-304-17023.

(b) An individual qualified under the provisions of WAC 296-304-180 through 296-304-18003 and 296-304-190 through 296-304-19001 to perform gear certification functions with respect to shore-based material handling devices.

(8) "Ton" means a ton of 2,240 pounds when applied to vessels' cargo handling gear, and a ton of 2,000 pounds when

applied to shore-based material handling devices or to shore-type cranes permanently mounted aboard barges or other vessels employed in domestic trade and designed on the basis of the 2,000-pound ton. Capacity ratings may be stated in pounds.

(9) "Nondestructive" examination means examination of structure or parts by electronic, ultrasonic, or other nondestructive examination suitable for the purpose.

[Order 74-25, § 296-304-13003, filed 5/7/74.]

**WAC 296-304-140 Procedure governing accreditation—Scope and application.** All sections of this chapter which include WAC 296-304-140 in the section number apply to procedure governing accreditation.

[Order 74-25, § 296-304-140, filed 5/7/74.]

**WAC 296-304-14001 Application for accreditation.**

(1) Application. Any person seeking accreditation shall file an original and duplicate copy of an application for accreditation with the director of the department of labor and industries, on a form provided by the department of labor and industries, for this purpose. Each application shall be signed and certified by the applicant and, if the applicant is an agency or organization, by a responsible officer of such agency or organization.

(2) Contents of application. The application form shall include the following information:

(a) A statement detailing the applicable types of work performed by the applicant in the past, noting the amount and extent of such work performed within the previous three years, listing representative vessels involved, and including representative job orders if available, or equivalent evidence;

(b) Descriptive details concerning any testing instruments and heat treatment furnaces which are to be used in conducting required tests or heat treatments. Test reports indicating that instruments meet the accuracy standards set forth in this section shall be included;

(c) A list setting forth the ports in which applicant currently conducts his business as well as those in which he proposes to conduct gear certification activities;

(d) A list of the applicant's responsible qualified personnel, both supervisory and managerial and including any surveyors, with resumes of their individual experience in the testing, examination, inspection and heat treatment of cargo gear. Such list shall include any branch office personnel or surveyors appointed to act in the applicant's behalf in any of the ports of the United States: Provided, however, That where the submission of individual resumes would be unduly burdensome because of the large number of persons engaged in the applicant's behalf, the applicant, after stating this fact, need only submit a list of its personnel together with a detailed statement of the qualifications upon which the appointment of surveyors is based;

(e) Names of at least three business references who will furnish information regarding work performed by the applicant;

(f) Any additional information the applicant deems to be pertinent.

[Order 74-25, § 296-304-14001, filed 5/7/74.]

**WAC 296-304-14003 Action upon application.** (1)

Upon receipt of an application for accreditation, the director shall approve or deny the application. The director may conduct an investigation, which may include a hearing, prior to approving or denying an application. To the extent he deems appropriate, the director may provide an opportunity to other interested persons to present data and views on the application prior to approval or denial.

(2) Any application which fails to present the information required by the prescribed form may be returned to the applicant with a notation of deficiencies and without prejudice to submission of a new or revised application.

(3) If the application is approved, notice of approval shall be mailed to the applicant. If the application is denied, notice of such denial shall be mailed to the applicant and such denial shall be without prejudice to any subsequent application except where such action is deemed to be in the public interest. In the event an application is denied with prejudice, the provisions of WAC 296-304-14013 shall be applicable.

(4) A copy of the notice of accreditation shall be kept on file by applicant at the applicant's place of business.

[Order 74-25, § 296-304-14003, filed 5/7/74.]

**WAC 296-304-14005 Duration and renewal of accreditation.** The period of accreditation shall not exceed three years. Applications for renewal of accreditation shall be made on the same form as described in WAC 296-304-14001. No accreditation shall expire until action on an application for renewal shall have been finally determined: Provided, That such application has been properly executed in accordance with WAC 296-304-14001 and filed with and received by the director not less than 15 nor more than 60 days prior to the expiration date. A final determination means either the approval or initial denial of the application for renewal. The procedure specified in WAC 296-304-14003 shall be applicable to all applications for renewal.

[Order 74-25, § 296-304-14005, filed 5/7/74.]

**WAC 296-304-14007 Criteria governing accreditation to certificate vessels' cargo gear.** (1) A person applying for accreditation to issue registers and pertinent certificates, to maintain registers and appropriate records, and to conduct initial, annual and quadrennial surveys, shall not be accredited unless he is engaged in one or more of the following activities:

- (a) Classification of vessels;
- (b) Certification of vessels' cargo gear;
- (c) Shipbuilding or ship repairing, or both insofar as related to work on vessels' cargo handling gear;
- (d) Unit and loose gear testing of vessels' cargo handling gear.

(2) Applicants for accreditation under WAC 296-304-14007(1) for operations in coastal or Great Lakes ports who come within WAC 296-304-14007 (1)(b) or (d) shall not be accredited unless they conduct at least 1,500 hours of cargo gear certification work per year.

(3) A person applying for accreditation to carry out tests of loose gear or wire rope, or both, or to carry out heat treatments, and to issue the related certificates, shall be engaged in one or both of the following activities:

- (a) Testing of loose gear or wire rope, or both;
- (b) Heat treatment of chains and loose cargo gear.

(4) A person applying for accreditation shall be staffed by individuals technically qualified to conduct the inspections and examinations and to conduct or supervise tests and heat treatments prescribed in this part. Any representatives, agents or surveyors acting on behalf of a person applying for accreditation in ports in which such operations are conducted shall be similarly qualified.

(a) Accreditation to conduct such nondestructive examination as may be a part of any certification activity may be granted to applicants found competent and equipped to carry out this activity.

(5) Except as noted in WAC 296-304-13501(3), and unless exemptions are granted under WAC 296-304-15001(8), a person applying for accreditation as specified in WAC 296-304-14007(1) shall be prepared to carry out all of the requirements of WAC 296-304-150 through 296-304-15005, 296-304-160 through 296-304-16025, and 296-304-170 through 296-304-17023 except that loose gear and wire rope tests and heat treatments may be carried out by the manufacturer of the gear concerned or by another person accredited specifically for this purpose.

(6) A person applying for accreditation shall have a satisfactory record of performance.

[Order 74-25, § 296-304-14007, filed 5/7/74.]

**WAC 296-304-14009 Voluntary amendment or termination of accreditation.** The accreditation of any person may be voluntarily amended or terminated upon written request filed with the director.

[Order 74-25, § 296-304-14009, filed 5/7/74.]

**WAC 296-304-14011 Suspension or revocation of accreditation.** The director may suspend or revoke an accreditation of any person for cause. Except in cases of willfulness or cases in which the public interest requires otherwise, before any accreditation is suspended or revoked facts or conduct which may warrant such action shall be called to the attention of the person involved in writing and that person shall be afforded an opportunity to achieve or demonstrate appropriate compliance.

[Order 74-25, § 296-304-14011, filed 5/7/74.]

**WAC 296-304-14013 Reconsideration and review.**

(1) Any person aggrieved by the action of the director or his authorized representative in denying, granting, suspending or revoking an accreditation under this section may within 15 days after such action, (a) file a written request for reconsideration thereof by the director or the authorized representative of the director who made the decision in the first instance, or (b) file a written request for review of the decision by the director or an authorized representative of the director, who has taken no part in the action which is the subject for review.

(2) A request for reconsideration shall be granted where the applicant shows that there is additional evidence which may materially affect the decision and that there were reasonable grounds for failure to adduce such evidence in the original proceedings.

(3) Any person aggrieved by the action of the director or authorized representative of the director in denying a request for reconsideration may, within 15 days after the denial of such request, file with the director or his authorized representative a written request for review.

(4) Any person aggrieved by the reconsidered determination of the director or authorized representative of the director, may within 15 days after such determination, file with the director a written request for review.

(5) A request for review shall be granted where reasonable grounds for the review are set forth in the request.

(6) If a request for reconsideration or review is granted, all interested persons shall be afforded an opportunity to present their views.

(7) No cargo gear certification function shall be performed by any person seeking reconsideration or review under this section pending the final decision with respect to such reconsideration or review.

[Order 74-25, § 296-304-14013, filed 5/7/74.]

**WAC 296-304-150 Duties of persons accredited to certificate vessels' cargo gear—Scope and application.** All sections of this chapter which include WAC 296-304-150 in the section number apply to duties of persons accredited to certificate vessels' cargo gear.

[Order 74-25, § 296-304-150, filed 5/7/74.]

**WAC 296-304-15001 General duties—Exemptions.**

(1) Except as noted in WAC 296-304-13501 and 296-304-15001(8), the requirements set forth in WAC 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023 shall be strictly adhered to in all testing, examinations, inspections and heat treatments.

(2) Supervision of all testing, examinations, inspections, and heat treatments shall be carried out only by such persons as are listed in the application for accreditation or subsequent supplements thereto, submitted pursuant to this section.

(3) The certificates issued by an accredited person shall be signed and all register entries made only by an authorized agent of such accredited person. No certification shall be issued until any deficiencies considered by the accredited person to constitute a currently unsatisfactory condition have been corrected. Replacement parts shall be of equal or better quality as original equipment and suitable for the purpose. In the event deficiencies remain uncorrected and no certification may therefore be issued, the accredited person shall inform the nearest district office of the department of labor and industries of the circumstances.

(4) Dynamometers or other recording test equipment owned by an accredited person shall have been tested for accuracy within the six months next preceding application for accreditation or renewal of same. Such test shall be performed with calibrating equipment which has been checked in turn so that indications are traceable to the U.S. Bureau of Standards. A copy of test reports shall accompany the application. Where test equipment is not the property of the accredited person, that person shall not issue any certificate based upon the use of such equipment unless its owner has made available a certificate of accuracy based on the requirements of this section, obtained within 1 year prior to such use,

and stating the errors of the equipment. Reasonable standards of accuracy shall be met and proof loads adjusted as necessary.

(5) An accredited person shall, upon request, provide the nearest local office of the department of labor and industries with advance information as to scheduled testing or of such other functions as are performed and facilitate the department of labor and industries observation of any such activities as it may desire to witness: Provided, however, That tests need not be delayed, except when specifically requested by the department of labor and industries under unusual circumstances.

(6) All cargo gear registers or certificates issued by an accredited person shall be made on forms prescribed or approved by the department of labor and industries.

(7) Unless otherwise instructed by the director in specific instances, any person accredited under WAC 296-304-14007(1) shall accept certificates relating to loose gear or wire rope tests or to heat treatments which are issued by the manufacturer of the gear concerned, by another person accredited specifically by the director for this purpose, or by any other person whose certificates are acceptable to the department of labor and industries. Such certificates shall either be attached as a part of the vessel's certification or shall be used as the basis for the issuance of the accredited person's own loose gear, wire rope, or heat treatment certificates. In the latter case, the original certificates shall be kept on file by the accredited person as part of the permanent record of the vessel concerned.

(8) In case of practical difficulties or unnecessary hardships, the director in his discretion may grant exemptions from any provision of WAC 296-304-150 through 296-304-15005, 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023.

[Order 74-25, § 296-304-15001, filed 5/7/74.]

**WAC 296-304-15003 Recordkeeping and related procedures concerning records in custody of accredited persons.** (1) An accredited person shall maintain records of all work performed under WAC 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023.

(2) An accredited person shall maintain a continuous record of the status of the certification of each vessel issued a register by such person.

(3) The records required in (1) and (2) of this section shall be available for examination by the director.

(4) When annual or quadrennial tests, inspections, examinations, or heat treatments are performed by an accredited person, other than the person who originally issued the vessel's register, such accredited person shall furnish copies of any certificates issued and information as to register entries to the person originally issuing the register.

(5) An accredited person shall inform the nearest local office of the department of labor and industries whenever a vessel is initially certificated under these regulations and a register in the prescribed form has been issued.

(6) A copy of each certificate relating to unit tests or thorough examinations, except those issued by the manufacturer and those issued by accredited persons outside of the United States, shall be sent to the nearest local office of the

department of labor and industries within 10 days after issuance. Such records shall form a part of the department of labor and industries file on the accredited person.

(7) An accredited person shall promptly notify the nearest local office of the department of labor and industries with respect to any changes in technical personnel, in fee schedules in geographical areas in which operations are conducted, or other pertinent substantial changes in its organization or operations.

[Order 74-25, § 296-304-15003, filed 5/7/74.]

**WAC 296-304-15005 Recordkeeping and related procedures concerning records in custody of the vessel.**

(1) A fully completed and up-to-date register shall be kept in the form prescribed or approved by the department of labor and industries, giving the particulars required with respect to:

(a) The inspections and thorough examinations required by WAC 296-304-16005 (1) and (2).

(b) The thorough examinations required by WAC 296-304-16005(3).

(c) The thorough examinations required by WAC 296-304-16009.

(d) The heat treatment required by WAC 296-304-16007 (1) and (2), and 296-304-16013.

(2) Certificates in the form prescribed or approved by the department of labor and industries shall be kept up-to-date, be attached to the register, and shall contain the particulars required with respect to:

(a) The testing and examinations required by WAC 296-304-16003, 296-304-16005(1) and 296-304-16013.

(b) The heat treatment required by WAC 296-304-16007 and 296-304-16013.

(3) The certificates and entries in the register shall be signed by a person qualified under WAC 296-304-17023.

(4) Adequate means shall be provided to enable persons examining the register, or any certificate attached thereto, to identify items of cargo gear referred to therein. Small items of gear, such as shackles, shall bear a mark to indicate that they have been initially tested.

(5) Records shall be kept aboard vessels identifying wire rope or articles of loose gear obtained from time to time and required to be certificated under the regulations of this section.

(6) An accredited person shall instruct the vessel's officers or the vessel's operator if the vessel is unmanned, that the vessel's register and certificates shall be preserved for at least 4 years after the date of the latest entry except in the case of nonrecurring test certificates concerning gear which is kept in use for a longer period, in which event the pertinent certificates shall be retained so long as that gear is continued in use.

(7) In cases where derricks, spouts, suckers, or cranes are mounted permanently aboard barges which remain in domestic inland waters service, the certification documentation shall comply with the provisions of WAC 296-304-20025.

[Order 74-25, § 296-304-15005, filed 5/7/74.]

**WAC 296-304-160 Certification of vessels' cargo gear—Scope and application.** All sections of this chapter which include WAC 296-304-160 in the section number apply to certification of vessels' cargo gear.

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[Order 74-25, § 296-304-160, filed 5/7/74.]

**WAC 296-304-16001 General.** (1) Except as noted in WAC 296-304-13501 and as provided in exemptions under WAC 296-304-15001(9), certification performed by accredited persons shall conform to the requirements contained in this section.

(2) Safe working loads assigned to assembled units of gear shall be based on applicable design criteria acceptable to the accredited person. Where no design data on which to base a rating is obtainable, the safe working load ratings assigned shall be based on the owner's information and warranty that those so assigned are correct. Unit test certificates shall state the basis for any such safe working load assignment.

[Order 74-25, § 296-304-16001, filed 5/7/74.]

**WAC 296-304-16003 Initial tests of cargo gear and tests after alterations, renewals or repairs.**

(1) Before being taken into use, hoisting machines, fixed gear aboard vessels accessory thereto, and loose gear and wire rope used in connection therewith, shall be tested and examined and the safe working load thereof certified in the manner set forth in WAC 296-304-170 through 296-304-17023.

(2) Replacement or additional loose gear and wire rope obtained from time to time shall also be tested and examined in the manner set forth in WAC 296-304-16003(1). However, the replacement of a component part of an article of loose gear, such as a sheave, pin, or bushing does not require a new test certificate so long as the new component at least equals in all particulars the part replaced.

(3) In the case of untested gear which has been in use, an initial test in conformance with WAC 296-304-16003(1) shall be carried out: Provided, however, That existing standing rigging and wire rope will not be required to be tested but shall be thoroughly examined to ascertain its fitness for continued use in conformance with the requirements of WAC 296-304-16023 and 296-304-16025.

(4) In the case of important alterations or renewals of the machinery and gear and also after repairs due to failure or damage to other than loose components, a test as required in WAC 296-304-16003(1) shall be carried out.

(5) If the operation in which cargo gear is engaged never utilizes more than a fraction of the safe working load rating, the owner may, at his option, have said gear certificated for, and limited in operation to, a lesser maximum safe working load: Provided, however, That the gear concerned is physically capable of operation at the original load rating and the load reduction is not for the purpose of avoiding correction of any deficiency.

(6) In no case shall safe working loads be increased beyond the original design limitations unless such increase is based on engineering calculations by or acceptable to the accredited certification agency, and all necessary structural changes are carried out.

[Order 74-25, § 296-304-16003, filed 5/7/74.]

**WAC 296-304-16005 Periodic tests, examinations and inspections.** After being taken into use, every hoisting machine, all fixed gear aboard vessels accessory thereto and

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loose gear used in connection therewith, shall be tested, thoroughly examined or inspected as follows:

(1) Derricks with their winches and accessory gear, including the attachments, as a unit; and cranes and other hoisting machines with their accessory gear, as a unit, shall be tested and thoroughly examined every four years in the manner set forth in WAC 296-304-170 through 296-304-17023.

(2) Derricks, their permanent attachments and any other fixed gear the dismantling of which is especially difficult shall be visually inspected every twelve months. In order to facilitate such inspection all derricks shall be lowered.

(3) All hoisting machines (e.g., cranes, winches), blocks, shackles, and all other accessory gear not included in WAC 296-304-16005(2), shall be thoroughly examined every twelve months by means of a visual examination, supplemented as necessary by other means, such as a hammer test or with electronic, ultrasonic, or other nondestructive methods, carried out as carefully as conditions permit in order to arrive at a reliable conclusion as to the safety of the parts examined. Particular attention shall be paid to the suitability for continued use of all swivels and the pins and bushing of blocks. If necessary, parts of the machines or gear shall be dismantled. If blocks are disassembled, all shell bolt nuts shall be securely locked upon reassembly.

(4) Where a derrick or crane is mounted on a barge hull and ballast tanks within the hull are used to facilitate use of the derrick or crane, or uncontrolled free surface may be a factor, each annual inspection or examination, as required, shall include such inspection as is necessary for the purpose of determining the integrity of any internals contributing to stability under conditions of use. The owner shall provide the accredited person with necessary information on any ballasting arrangements required.

(5) Annual inspection or examination, as required, shall include, among other things, examination of the following:

(a) Derrick heel attachment points. Heel pins may, if possible, be examined by nondestructive examination.

(b) Shrouds and stays necessary in the use of the gear, together with attachment points.

(c) Deck fittings for the securing of vang, topping lifts, and/or preventers.

(d) Means of attachment to the hull of "A" frame or other fixed derrick or crane structure and of mobile types of equipment permanently placed aboard the barge or vessel.

(e) Clamshell buckets or other similar equipment, such as magnets, etc., used in conjunction with a derrick or crane mounted aboard a vessel, with particular attention to closing line wires and sheaves. The accredited person may supplement such examination by requesting any operational tests he may deem appropriate.

(f) Winch and other operating drums for excessive wear or defect.

[Order 74-25, § 296-304-16005, filed 5/7/74.]

**WAC 296-304-16007 Heat treatment.** (1) All chains (other than bridle chains attached to derricks or masts), rings, hooks, shackles, and swivels made of wrought iron, which are used in hoisting or lowering, shall be annealed in accordance with WAC 296-304-17021 at the following intervals:

(a) Half inch and smaller chains, rings, hooks, shackles, and swivels in general use, at least once every six months; and

(b) All other chains, rings, hooks, shackles, and swivels in general use, at least once every twelve months.

(c) In the case of gear used solely on lifting machinery worked by hand, twelve months shall be substituted for six months in WAC 296-304-16007 (1)(a) and two years for twelve months in WAC 296-304-16007 (1)(b).

(d) When used in this paragraph, the term "in general use" means used on fifty-two or more days in a year. In any case, however, the period between annealings shall not exceed two years.

(2) Chains, rings, hooks, shackles, and swivels made of material other than wrought iron or steel shall be heat treated when necessary in accordance with WAC 296-304-17021(2).

[Order 74-25, § 296-304-16007, filed 5/7/74.]

**WAC 296-304-16009 Exemptions from heat treatment.** Gear made of steel, or gear which contains (as in ball bearing swivels), or is permanently attached to (as with blocks), equipment made of materials which cannot be subjected to heat treatment, shall be exempt from the requirements of WAC 296-304-16007. Such gear, however, shall be thoroughly examined in the manner described in WAC 296-304-16005(3).

[Order 74-25, § 296-304-16009, filed 5/7/74.]

**WAC 296-304-16011 Grace periods.** Grace periods allowed in connection with the requirements of this section are as follows:

(1) Annual or six-month requirements - by the end of the voyage during which they become due;

(2) Quadrennial requirements - within six months after the date when due;

(3) Grace periods shall not be deemed to extend subsequent due dates.

[Order 74-25, § 296-304-16011, filed 5/7/74.]

**WAC 296-304-16013 Gear requiring welding.** Chains or other gear which have been lengthened, altered or repaired by welding, shall be properly heat treated where necessary, and, before again being put into use, shall be tested and reexamined in the manner set forth in WAC 296-304-170 through 296-304-17023.

[Order 74-25, § 296-304-16013, filed 5/7/74.]

**WAC 296-304-16015 Damaged components.** (1) Pursuant to WAC 296-304-18003, any derrick or associated permanent fitting which is deformed in service between surveys shall be subjected to proof test to determine its suitability for continued service. If a proof test indicates that the derrick or associated permanent fitting may be continued in service without repair, a note of the existing deformity shall be made on the test certificate. When, in the opinion of the accredited person, it is unsafe to conduct a proof test with an existing deformity, the derrick or associated permanent fitting shall be replaced or repaired and then subjected to proof test in accordance with WAC 296-304-170 through 296-304-17023.

(2) Any loose gear components which are injured or deformed by a proof load shall be replaced before a certificate is issued.

(3) Any derrick, other fixed installation, or associated permanent fitting, which is injured or deformed by a proof load shall be replaced or repaired and another proof load test shall be conducted without damage before a certificate is issued.

[Order 74-25, § 296-304-16015, filed 5/7/74.]

**WAC 296-304-16017 Marking and posting of safe working loads.** (1) The safe working load of the assembled gear and the minimum angle to the horizontal at which this load may be applied shall be plainly marked at the heels of all booms along with the date of the test. Where gear is certificated for use in union purchase, the union purchase safe working load shall also be plainly marked. Any limitations shall be noted in the vessel's papers.

(2) The safe working load shall be marked on all blocks used in hoisting or lowering.

(3) When the capacity of the boom of a crane or derrick has been or will be rated in accordance with the variance of its radius, the maximum safe working loads for the various working angles of the boom and the maximum and minimum radius at which the boom may be safely used, shall be conspicuously posted near the controls and visible to the crane operator. Ratings may be stated in pounds. When they are stated in tons of 2,000 pounds, this fact shall be indicated.

[Order 74-25, § 296-304-16017, filed 5/7/74.]

**WAC 296-304-16019 Requirements governing braking devices and power sources.** All types of winches and cranes shall be provided with means to stop and hold the proof load in any position, and the efficiency of such means shall be demonstrated. Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or electric cranes, shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator. Current for operation of electric winches and cranes during the tests shall be taken from the vessel's circuits. Shore current may be used if it passes through the vessel's main switchboard.

[Order 74-25, § 296-304-16019, filed 5/7/74.]

**WAC 296-304-16021 Means of derrick attachment.** Appropriate measure shall be taken to prevent the foot of a derrick from being accidentally lifted from its socket or support during the test.

[Order 74-25, § 296-304-16021, filed 5/7/74.]

**WAC 296-304-16023 Limitations on use of wire rope.** (1) An eye splice made in any wire rope shall have at least three tucks with a whole strand of rope and two tucks with one-half of the wires cut out of each strand. However, this requirement shall not operate to preclude the use of another form of splice or connection which can be shown to be as efficient.

(2) Except for eye splices in the ends of wires, each wire rope used in hoisting or lowering, in guying derricks, or as a

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topping lift, preventer or pendant, shall consist of one continuous piece without knot or splice.

(3) Eyes in the ends of wire rope cargo falls shall not be formed by knots and, in single part falls, shall not be formed by wire rope clips.

(4) The ends of falls shall be secured to the winch drums by clamps, U-bolts, shackles or some other equally strong method. Fiber rope fastenings shall not be used.

(5) Wire rope shall not be used for the vessel's cargo gear if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect. Particular attention shall be given to the condition of those sections of wire rope adjacent to any terminal connections, those sections exposed to abnormal wear, and those sections not normally exposed for examination.

[Order 74-25, § 296-304-16023, filed 5/7/74.]

**WAC 296-304-16025 Limitations on use of chains.** Chains forming a part of vessel's cargo gear shall not be used when, due to stretch, the increase of length of a measured section exceeds five percent, when a link is damaged, or when other external defects are evident. Chains shall not be shortened by bolting, wiring, or knotting.

[Order 74-25, § 296-304-16025, filed 5/7/74.]

**WAC 296-304-170 Certification of vessels—Tests and proof loads—Heat treatment—Competent persons—Scope and application.** All sections of this chapter which include WAC 296-304-170 in the section number apply to certification of vessels: Tests and proof loads; heat treatment; competent persons.

[Order 74-25, § 296-304-170, filed 5/7/74.]

**WAC 296-304-17001 Visual inspection before tests.** Before any test under this WAC 296-304-170 through 296-304-17023 is carried out, a visual inspection of the gear involved shall be conducted and any visibly defective gear shall be replaced or repaired. The provisions of WAC 296-304-16005(4) shall be adhered to.

[Order 74-25, § 296-304-17001, filed 5/7/74.]

**WAC 296-304-17003 Unit proof test—Winches, derricks and gear accessory thereto.** (1) Winches, with the whole of the gear accessory thereto (including derricks, goosenecks, eye plates, eye bolts, or other attachments), shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons . . . . .	25 percent in excess.
20-50 tons . . . . .	5 tons in excess.
Over 50 tons . . . . .	10 percent in excess.

(2) The proof load shall be lifted with the vessel's normal tackle with the derrick at an angle not more than 15 degrees to the horizontal, or, at the designed minimum angle when this is greater, or, when this is impracticable, at the lowest practicable angle. The angle at which the test was made shall be stated in the certificate of test. After the proof load has been lifted, it shall be swung as far as possible in both direc-

tions. In applying the proof load, the design factors of the gear concerned will determine whether the load is applied with a single part fall or with a purchase and the certificate of test shall state the means used. Where winches are fitted with mechanical brakes for manual operation they shall be demonstrated to be in satisfactory operating condition.

(3) In the case of heavy lift derrick barges, proof loads shall be applied, except as limited by design and stability considerations, at the maximum and minimum radius for which designed, as well as at any intermediate radius which the surveyor may deem necessary, and shall be swung as far as possible in both directions. Data with respect to each proof load applied shall be entered in the test certificate.

(4) No items of cargo gear furnished by outside sources shall be used as a part of the vessel's gear for the purpose of accomplishing the proof test.

(5) All tests prescribed by this section should in general be carried out by dead load, except that in the case of quadrennial tests, replacements, or renewals, spring or hydraulic balances may be used where dead loads are not reasonably available. However, no exception shall be allowed in the case of gear on new vessels.

(6) The test shall not be regarded as satisfactory unless the indicator remains constant under the proof load for a period of at least 5 minutes.

(7) The safe working load, determined pursuant to the requirements of this section, shall be applicable only to a swinging derrick. When using two fixed derricks in "union purchase" rigs, the safe working load should generally be reduced. It is recommended that owners obtain union purchase safe working load certification based upon design study and analysis by, or acceptable to, a qualified technical office of an accredited gear certification agency, with the recognition that such determinations are valid only for the conditions contemplated in the analysis.

(a) Where both guys and preventers are fitted, union purchase certification shall state whether the guy or the preventer is the working strength member, when the guy is for slewing only, and when the guy and preventor should share working loads as far as practicable.

(8) When necessary in the proof testing of heavy derricks, the appropriate shrouds and stays shall be rigged.

[Order 74-25, § 296-304-17003, filed 5/7/74.]

**WAC 296-304-17005 Unit proof tests—Cranes and gear accessory thereto.** (1) Except as noted in WAC 296-304-17005(5), cranes and other hoisting machines, together with gear accessory thereto, shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons . . . . .	25 percent in excess.
20-50 tons . . . . .	5 tons in excess.
Over 50 tons . . . . .	10 percent in excess.

(2) The proof load shall be lifted and swung as far as possible in both directions. If the jib or boom of the crane has a variable radius, it shall be tested with proof loads, as specified in WAC 296-304-17005(1), at the maximum and minimum radius. In the case of hydraulic cranes, when owing to the limitation of pressure it is impossible to lift a load 25 per-

cent in excess of the safe working load, it will be sufficient to lift the greatest possible load.

(3) Initial proof tests of new cranes shall be made only with a dead load as specified in WAC 296-304-17005(2).

(4) Initial tests of cranes which have been in service, quadrennial tests, or tests associated with replacements or renewals, may be made with spring or hydraulic balances where dead loads are not reasonably available, under the following conditions:

(a) Tests shall be conducted at maximum, minimum, and intermediate radius points, as well as such points in the arc of rotation as meet with the approval of the accredited person.

(b) An additional test shall be conducted with partial load and shall include all functions and movements contemplated in the use of the crane.

(5) In cases where shore-type cranes are mounted permanently aboard barges, the requirements of WAC 296-304-170 through 296-304-17023 with respect to unit proof tests and examinations shall not apply and the applicable requirements of WAC 296-304-200 through 296-304-20025 shall be adhered to with respect to unit proof tests and examinations.

[Order 74-25, § 296-304-17005, filed 5/7/74.]

**WAC 296-304-17007 Limitations on safe working loads and proof loads.** The proof loads specified in WAC 296-304-17003 and 296-304-17005 shall be adjusted as necessary to meet any pertinent limitations based on stability and/or on structural competence at particular radii. Safe working loads shall be reduced accordingly.

[Order 74-25, § 296-304-17007, filed 5/7/74.]

**WAC 296-304-17009 Examinations subsequent to unit tests.** (1) After satisfactory completion of the unit proof load tests required by WAC 296-304-17003 and 296-304-17005, the cargo gear and all component parts thereof shall be given a thorough visual examination, supplemented as necessary by other means, such as a hammer test or with electronic, ultrasonic, or other nondestructive methods, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use.

(2) When the test of gear referred to in WAC 296-304-17008(1) is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins of the blocks included in this test need not be removed unless there is evidence of deformation or failure.

(3) For subsequent tests such parts of the gear shall be dismantled or disassembled after the test as necessary to determine their suitability for continued service.

(4) When blocks are disassembled all shell bolt nuts shall be securely locked upon reassembly.

(5) In carrying out the requirements of this section, replacement shall be required of:

(a) Any swivel found to have excessive tolerance as a result of wear on any bearing surface.

(b) Pins of blocks found to be shouldered, notched, or grooved from wear, in which case, in addition to replacing the pin, sheave bushings shall be examined for suitability for continued use.

[Order 74-25, § 296-304-17009, filed 5/7/74.]

**WAC 296-304-17011 Proof tests—Loose gear.** (1) Chains, rings, shackles and other loose gear (whether accessory to a machine or not) shall be tested with a proof load equal to that shown against the article in the following table:

<b>Article of gear</b>	<b>Proof load</b>
Chain, ring, hook, shackle or swivel . . . . .	100 percent in excess of the safe working load.
Blocks:	
Single sheave block . . . .	300 percent in excess of the safe working load. <sup>1</sup>
Multiple sheave block with safe working load up to and including 20 tons . . . . .	100 percent in excess of the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons . . . . .	20 tons in excess of the safe working load.
Multiple sheave block with safe working load over 40 tons . . . . .	50 percent in excess of the safe working load.
Pitched chains used with hand-operated blocks and rings, hooks, shackles or swivels permanently attached thereto. . . . .	50 percent in excess of the safe working load.
Hand-operated blocks used with pitched chains and rings, hooks, shackles or swivels permanently attached thereto . . . . .	50 percent in excess of the safe working load.

<sup>1</sup>The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin of the block when lifting the nominal safe working load defined in WAC 296-304-17011 (1)(a) below. The proof load is, therefore, equal to four times the safe working load as defined in WAC 296-304-17011 (1)(a) below or twice the safe working load as defined in WAC 296-304-17011 (1)(b) below.

(a) The nominal safe working load of a single-sheave block should be the maximum load which can be safely lifted by the block when the load is attached to a rope which passes around the sheave of the block.

(b) In the case of a single-sheave block where the load is attached directly to the block instead of to a rope passing around the sheave, it is permissible to lift a load equal to twice the nominal safe working load of the block as defined in WAC 296-304-17011 (1)(a) above.

(c) In the case of a lead block so situated that an acute angle cannot be formed by the two parts of the rope passing over it (i.e., the angle is always 90° or more), the block need not have a greater nominal safe working load than one-half the maximum resultant load which can be placed upon it.

(2) In cases where persons accredited to carry out loose gear tests may be retained to conduct tests of special stevedoring gear as described in WAC 296-56-45001(2), which does not form part of a vessel's equipment, such tests shall

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adhere to the requirements set forth in WAC 296-56-45001 (2)(a), (b) and (c).

(3) After being tested as required by WAC 296-304-17011(1), and before being taken into use, all chains, rings, hooks, shackles, blocks or other loose gear, except as noted in WAC 296-304-17013, shall be thoroughly examined, the sheaves and pins of the blocks being removed for this purpose, to determine whether any part has been injured or permanently deformed by the test. Shell bolt nuts shall be securely locked upon reassembly. Defective loose gear components shall be replaced before the certificate is issued.

(4) Any certificate relating to shackles, swivels or strength members of single-sheave blocks which have been restored to original dimensions by welding shall state this fact.

[Order 74-25, § 296-304-17011, filed 5/7/74.]

**WAC 296-304-17013 Specially designed blocks and components.** (1) Blocks and connecting components of an unusual nature which are specially designed and constructed as an integral part of a particular lifting unit and are either permanently affixed or of such design that two or more components must be tested together need not be considered as loose gear for purposes of WAC 296-304-17011.

(2) In lieu of the loose gear proof test required by WAC 296-304-17011(1), design data shall be submitted to an accredited certification agency indicating design and material specifications and analysis whereby the designed strength of such gear may be determined.

(3) Subsequent to the test of the lifting unit as a whole, a thorough visual examination shall be made of disassembled parts and an electronic, ultrasonic, or other equally efficient nondestructive examination shall be made of those parts not dismantled to ensure the safe condition of such parts.

[Order 74-25, § 296-304-17013, filed 5/7/74.]

**WAC 296-304-17015 Proof tests—Wire rope.** Wire rope, except as provided in WAC 296-304-16003(2), shall be tested by sample, a piece being tested to destruction, and the safe working load of running ropes, unless otherwise acceptable to the department of labor and industries on the basis of design, shall not exceed one-fifth of the breaking load of the sample tested. In the case of running ropes used in gear with a safe working load exceeding 10 tons, the safe working load shall not exceed one-fourth of the breaking load of the sample tested.

[Order 74-25, § 296-304-17015, filed 5/7/74.]

**WAC 296-304-17017 Proof tests after repairs or alterations.** When proof loads are applied after repairs or alterations, all parts of the assembled gear shall be examined as required in WAC 296-304-17009, 296-304-17011(3), or 296-304-17013(c), whichever is applicable.

[Order 74-25, § 296-304-17017, filed 5/7/74.]

**WAC 296-304-17019 Order of tests.** When both unit and loose gear proof load tests are required, the loose gear test may be carried out after completion of the unit test.

[Order 74-25, § 296-304-17019, filed 5/7/74.]

**WAC 296-304-17021 Heat treatment.** (1) The annealing of wrought iron gear required by this section shall be accomplished at a temperature between 1100° and 1200°F. and the exposure shall be of between thirty and sixty minutes duration. After being annealed, the gear shall be allowed to cool slowly and shall then be carefully inspected. All annealing shall be carried out in a closed furnace.

(2) When heat treatment of loose gear made of other than wrought iron or steel is recommended by the manufacturer, it shall be carried out in accordance with the specifications of the manufacturer.

[Order 74-25, § 296-304-17021, filed 5/7/74.]

**WAC 296-304-17023 Competent persons.** All gear certification functions shall be performed by competent persons as set forth in the following table:

Functions	Competent person
Any testing, examination, inspection, or heat treatment required in United States ports.	Responsible individual, surveyor or other authorized agent of a person accredited by the department of labor and industries under the regulations contained in this part.
Any testing, examination, inspection, or heat treatment required to be performed while the vessel is in other than United States ports.	Responsible individual, surveyor or other authorized agent of persons recognized by the Commandant of the United States Coast Guard or by a foreign nation whose certification is accepted by the department of labor and industries as being in substantial accordance with WAC 296-304-15005(1).
Testing, examination and inspection of loose gear or wire rope; heat treatment of loose gear.	Employees or authorized agents of persons accredited specifically by the department of labor and industries for this purpose under the regulations contained in this section, or the manufacturer of the gear concerned unless disapproved by the director.

[Order 74-25, § 296-304-17023, filed 5/7/74.]

**WAC 296-304-180 Accreditation to certificate shore-based equipment—Scope and application.** All sections of this chapter which include WAC 296-304-180 in the section

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number apply to accreditation to certificate shore-based equipment.

[Order 74-25, § 296-304-180, filed 5/7/74.]

**WAC 296-304-18001 Eligibility for accreditation to certificate shore-based material handling devices covered by chapter 296-56 WAC of the safety and health regulations for longshoring.** (1) A person applying for accreditation to carry out certification activities and to issue and maintain the requisite records must be:

(a) A manufacturer of cranes or derricks or of specialized equipment of the type for which accreditation application is made, or a person or organization representing such a manufacturer in a technical capacity; or

(b) Technically experienced and qualified to carry out examinations and/or testing, as applicable, of vessels or shore-based equipment or gear of the type for which accreditation application is made.

(2) The owner of shore-based equipment affected may designate a member of his organization to carry out certification functions respecting the owner's equipment, on the following conditions:

(a) The designee is technically experienced and qualified in the inspection and maintenance or design of the type of equipment involved, aside from employment as an operator only.

(b) The designee has applied to an accredited, nationally operating certification agency and has been granted appointment or equivalent recognition by that agency as a surveyor for the purpose intended.

(c) Certification activities carried out by the designee are cleared through the offices, and are subject to the approval, of the accredited certifying agency. When equipment is found satisfactory for use upon any survey, said equipment may be used pending receipt of notification of such approval or any disapproval.

(d) In cases where equipment is certificated by a person designated by the equipment owner, the cognizant accredited certification agency retains the right to inspect such equipment as desired and convenient, in order to ascertain the adequacy of the certification activity performed.

(3) Accreditation to conduct such nondestructive examination as may be a part of any certification activity may be granted to applicants found competent and equipped to carry out this activity.

(4) Unless exemptions are granted at the discretion of the director in cases of practical difficulties or unnecessary hardship, applicants for accreditation as specified in this section shall be prepared to carry out all necessary functions, except that any requisite wire rope tests, nondestructive examinations, and heat treatments may be carried out by the manufacturer of the gear concerned or by another person accredited specifically for these purposes.

(5) A person applying for accreditation shall have a satisfactory record of relevant experience and performance.

[Order 74-25, § 296-304-18001, filed 5/7/74.]

**WAC 296-304-18003 Provisions respecting application for accreditation, action upon the application, and related matters.** The provisions of WAC 296-304-14001,

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296-304-14003, 296-304-14005, 296-304-14009, 296-304-14011 and 296-304-14013 shall govern accreditation to certificate shore-based material handling devices, to the extent applicable.

[Order 74-25, § 296-304-18003, filed 5/7/74.]

**WAC 296-304-190 Duties of persons accredited to certificate shore-based material handling devices—General duties, exemptions.** The requirements of WAC 296-304-200 through 296-304-20025 shall be strictly observed: Provided, however, That in cases of practical difficulties or unnecessary hardship, the director in his discretion may grant exemptions or variations from any provision in that section.

(1) Except as otherwise noted in this section, all functions required by WAC 296-304-200 through 296-304-20025 shall be carried out by or under the supervision of a person accredited for the purpose or by his authorized representative.

(2) All required unit proof load tests shall be carried out by the use of weights as a dead load. Only where this is not possible may dynamometers or other recording test equipment be used. Any such recording test equipment owned by an accredited person shall have been tested for accuracy within the 6 months next preceding application for accreditation or renewal thereof. Such test shall be performed with calibrating equipment which has been checked in turn so that indications are traceable to the U.S. Bureau of Standards. A copy of test reports shall accompany the accreditation application. Where test equipment is not the property of the accredited person, that person shall not issue any certificate based upon the use of such equipment unless its owner has made available a certificate of accuracy based on the requirements of this section, obtained within the year prior to such use, and stating the errors of the equipment. In any event reasonable standards of accuracy shall be met and proof loads adjusted as necessary.

(3) The qualifications of any person appointed or recognized by any accredited person for the purpose of carrying out certification functions shall meet with the approval of the director.

(4) WAC 296-304-15001 (5) and (7) and 296-304-15003 shall govern, to the extent applicable, persons accredited under WAC 296-304-180 through 296-304-18003.

[Order 74-25, § 296-304-190, filed 5/7/74.]

**WAC 296-304-200 Certification of shore-based material handling devices—Scope and application.** All sections of this chapter which include WAC 296-304-200 in the section number apply to certification of shore-based material handling devices.

[Order 74-25, § 296-304-200, filed 5/7/74.]

**WAC 296-304-20001 General provisions.** (1) Certification of shore-based material handling devices shall conform to the requirements contained in this section, except in cases for which exemptions or variations have been granted by the director as provided in WAC 296-304-18001(4) and 296-304-19001(1).

(2) Any replacements or repairs deemed necessary by the accredited person shall be carried out before application of a proof test.

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(3) "Ton" in this section means a ton of 2,000 pounds.

(4) When applied to shore-based material handling devices, ratings may be stated in pounds rather than tons. When stated in tons of 2,000 pounds, this fact shall be indicated.

[Order 74-25, § 296-304-20001, filed 5/7/74.]

**WAC 296-304-20003 Unit proof test and examination of cranes.** (1) Unit proof tests of cranes shall be carried out at the following times:

(a) In the cases of new cranes, before initial use and every 4 years thereafter.

(b) In the cases of uncertificated cranes which have been in use, at the time of initial certification and every 4 years thereafter.

(c) After important alterations and renewals, and after repairs due to failure of, or damage to, major components.

(2) Unit proof load tests of cranes shall be carried out where applicable with the boom in the least stable direction relative to the mounting, based on the manufacturer's specifications.

(3) Unit proof load tests shall be based on the manufacturer's load ratings for the conditions of use and shall, except in the case of bridge type cranes utilizing a trolley, consist of application of a proof load of 10 percent in excess of the load ratings at maximum and minimum radius, and at such intermediate radii as the certifying authority may deem necessary in the circumstances.<sup>1</sup> Trolley equipped cranes shall be subject to a proof load of 25 percent in excess of the manufacturer's load rating. In cases of foreign manufacture, the manufacturer's specifications shall be subject to approval by the certifying authority as being equivalent to U.S. practice.

<sup>1</sup>The manufacturer's load ratings are usually based upon percentage of tipping loads under some conditions and upon limitations of structural competence at others, as well as on other criteria such as type of crane mounting, whether or not outriggers are used, etc. Some cranes utilizing a trolley may have only one load rating assigned and applicable at any outreach. It is important that the manufacturer's ratings be used.

The weight of all auxiliary handling devices such as, but not limited to, magnets, hooks, slings, and clamshell buckets shall be considered part of the load.

(4) An examination shall be carried out in conjunction with each unit proof load test. The accredited person, or his authorized representative, shall make a determination as to correction of deficiencies found. The examination shall cover the following points as applicable:

(a) All functional operating mechanisms shall be examined for improper function, maladjustment, and excessive component wear, with particular attention to sheaves, pins, and drums. The examination shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed.

(b) All safety devices shall be examined for malfunction.

(c) Lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems shall be examined for deterioration or leakage.

(d) Loose gear components, such as hooks, including wire rope and wire rope terminals and connections, shall be checked with particular attention to sections of wire rope

exposed to abnormal wear and to sections not normally exposed for examination. The provisions of WAC 296-304-16023 shall apply in wire rope examinations. Cracked or deformed hooks shall be discarded and not reused on any equipment subject to the provisions of chapter 296-56 WAC longshoring and WAC 296-304-130 through 296-304-13503.

(e) Rope reeving shall comply with manufacturer's recommendations.

(f) Deformed, cracked, or excessively corroded members in crane structure and boom shall be repaired or replaced as necessary.

(g) Loose bolts, rivets, or other connections shall be corrected.

(h) Worn, cracked, or distorted parts affecting safe operation shall be corrected.

(i) Brake and clutch system parts, linings, pawls, and ratchets shall be examined for excessive wear and free operation.

(j) Load, boom angle, or other indicators shall be checked over their full range for any significant inaccuracy. A boom angle or radius indicator shall be fitted.

(k) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the manufacturer's capacity ratings at all operating radii, for all permissible boom lengths and jib lengths, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included. Operating controls shall be marked or an explanation of controls shall be posted at the operator's position to indicate function.

(l) Where used, clamshell buckets or other similar equipment such as magnets, etc., shall be carefully examined in all respects, with particular attention to closing line wires and sheaves. The accredited person may supplement such examination by requesting any operational tests as may be appropriate.

(m) Careful examination of the junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts.

(n) It shall be ascertained that no counterweights in excess of the manufacturer's specifications are fitted.

(o) Such other examination or supplemental functional tests shall be made as may be deemed necessary by the accredited person under the circumstances.

[Order 74-25, § 296-304-20003, filed 5/7/74.]

**WAC 296-304-20005 Annual examination of cranes.**

(1) In any year in which no quadrennial unit proof test is required, an examination shall be carried out by an accredited person or his authorized representative. Such examination shall be made not later than the anniversary date of the quadrennial certification and shall conform with the requirements of WAC 296-304-20003(4).

[Order 74-25, § 296-304-20005, filed 5/7/74.]

**WAC 296-304-20007 Unit proof test and examination of derricks.** (1) Unit proof tests of derricks shall be carried out at the same times as are specified in WAC 296-304-20003(1) for cranes.

(2) Unit proof load tests and safe working load ratings shall be based on the design load ratings at the ranges of boom angles or operating radii. Unit proof loads shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons . . . . .	25 percent in excess.
20-50 tons . . . . .	5 tons in excess.
Over 50 tons . . . . .	10 percent in excess.

Proof loads shall be applied at the designed maximum and minimum boom angles or radii, or, if this is impracticable, as close to these as practicable. The angles or radii of test shall be stated in the certificate of test. Proof loads shall be swung as far as possible in both directions. The weight of all auxiliary handling devices shall be considered a part of the load.

(3) After satisfactory completion of a unit proof load test the derrick and all component parts thereof shall be carefully examined in accordance with the requirements of WAC 296-304-20003(4), as far as applicable.

[Order 74-25, § 296-304-20007, filed 5/7/74.]

**WAC 296-304-20009 Annual examination of derricks.**

(1) In any year in which no quadrennial unit proof test is required, an examination shall be carried out by an accredited person or his authorized representative. Such annual examination shall be made not later than the anniversary date of the quadrennial certification and shall conform in all applicable respects with WAC 296-304-20003(4).

[Order 74-25, § 296-304-20009, filed 5/7/74.]

**WAC 296-304-20011 Determination of crane or derrick safe working loads and limitations in absence of manufacturer's data.**

(1) In the event neither manufacturer's data nor design data on safe working loads (including any applicable limitations) are obtainable, the safe working load ratings assigned shall be based on the owner's information and warranty that those so assigned are correct. Unit test certificates shall state the basis for any such safe working load assignment.

[Order 74-25, § 296-304-20011, filed 5/7/74.]

**WAC 296-304-20013 Safe working load reduction.**

(1) If the operation in which equipment is engaged never utilizes more than a fraction of the safe working load rating, the owner of such equipment may, at his option, have the crane or derrick certificated for and operated at a lesser maximum safe working load in keeping with the use and based on radius and other pertinent factors: Provided, however, That the equipment concerned is physically capable of operation at the original load rating and the load reduction is not for the purpose of avoiding correction of any deficiency.

[Order 74-25, § 296-304-20013, filed 5/7/74.]

**WAC 296-304-20015 Safe working load increase.**

(1) In no case shall safe working loads be increased beyond the manufacturer's ratings or original design limitations unless such increase meets with the manufacturer's approval. Where the manufacturer's services are not available, or where the

equipment is of foreign manufacture, engineering design analysis by, or acceptable to, the accredited certification agency is required. All necessary structural changes shall be carried out.

[Order 74-25, § 296-304-20015, filed 5/7/74.]

**WAC 296-304-20017 Nondestructive examination.**

(1) Wherever it is considered necessary by the accredited person or his authorized representative and wherever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic ultrasonic or other nondestructive methods may be carried out, provided that the procedure followed is acceptable to the director and the person carrying out such examination is accredited or acceptable to the director for the purpose.

[Order 74-25, § 296-304-20017, filed 5/7/74.]

**WAC 296-304-20019 Wire rope.** (1) Wire rope and replacement wire rope shall be of the same size, same or better grade, and same construction as originally furnished by the equipment manufacturer or contemplated in the design, unless otherwise recommended by the equipment or the wire rope manufacturer due to actual working condition requirements. In the absence of specific requirements as noted, wire rope shall be of a size and construction suitable for the purpose, and a safety factor of 4 shall be adhered to, and verified by wire rope test certificate.

(2) Wire rope in use on equipment previously constructed and prior to initial certification of said equipment shall not be required to be tested but shall be subject to thorough examination at the time of initial certification of the equipment.

[Order 74-25, § 296-304-20019, filed 5/7/74.]

**WAC 296-304-20021 Heat treatment.** (1) Wherever heat treatment of any loose gear is recommended by the manufacturer, it shall be carried out in accordance with the specifications of the manufacturer.

[Order 74-25, § 296-304-20021, filed 5/7/74.]

**WAC 296-304-20023 Examination of bulk cargo loading or discharging spouts or suckers.** (1) Those portions of bulk cargo loading or discharging spouts or suckers which extend over vessels, together with any portable extensions, rigging components, outriggers, and attachment points, supporting them or any of their components vertically, shall be examined annually. The examination shall be carried out with particular attention to the condition of wire rope and accessories. The equipment shall not be considered satisfactory unless, in the opinion of the accredited person or his authorized representative, it is deemed fit to serve its intended function.

[Order 74-25, § 296-304-20023, filed 5/7/74.]

**WAC 296-304-20025 Documentation.** (1) Documents issued respecting a certification function by an accredited person shall be on forms approved for such use by the director and shall so state.

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(2) Such documents shall be issued by the accredited person to the owners of affected equipment, attesting to satisfactory compliance with applicable requirements. The forms used shall contain the following information:

(a) Unit proof tests where required—

(i) Identification of crane or derrick including manufacturer, model number, serial number, and ownership.

(ii) Basis for assignment of safe working load ratings, with the ratings assigned (i.e., whether based on manufacturer's ratings, whether for any specific service, etc.).

(iii) Proof test details noting radii and proof loads, how applied, and, where applicable, direction relative to mounting.

(iv) A statement that the test and associated examination were conducted and all applicable requirements of this section are met.

(v) Any necessary remarks or supplementary data, including limitations imposed and the reason therefor.

(vi) Name of accredited person and identification of authorized representative actually conducting test and/or examination.

(vii) Authorized signature of accredited person, date and place of test and/or examination.

(b) Annual examination of cranes or derricks—

(i) Information specified in WAC 296-304-20025 (2)(a)(i), (v), (vi) and (vii).

(ii) A statement that the required examination has been carried out and that, in the opinion of the accredited person or his authorized representative, the equipment has been found in compliance in all applicable respects with the requirements of this section.

(c) Annual examination of bulk cargo loadings or discharging spouts or suckers—

(i) Specific identification of equipment.

(ii) A statement that examination has been completed and that, in the opinion of the accredited person or his authorized representative, the equipment meets the criteria of WAC 296-304-20023(1).

(iii) Information specified in WAC 296-304-20025 (2)(a)(i), (v), (vi) and (vii).

(3) Certificates relating to wire rope, whether tested by or under the supervision of the accredited person or by its manufacturer and whether or not issued on the basis of the manufacturer's certificates, shall follow the general format of a wire rope test form approved by the director.

(4) Accredited persons shall advise owners of affected equipment of the necessity for maintaining required documentation or acceptable copies thereof available for inspection at or near the worksite of the equipment involved.

(a) Where initial and periodic tests as well as annual examinations are required, documentation available for inspection shall include the latest unit test certificate and any subsequent annual examination certificates, together with wire rope test certificates relating to any replacements since the last unit test or annual examination.

(b) Where only annual examination is required, documentation available for inspection shall include the latest annual examination certificate and wire rope test certificates relating to any wire replaced since the last annual examination.

(c) In the event that heat treatment of any loose gear is recommended by its manufacturer, the latest heat treatment certificate, attesting to compliance with the manufacturer's specifications, shall be part of the available documentation.

(5) No certification shall be issued until any deficiencies considered by the accredited person to constitute a currently unsatisfactory condition have been corrected. Replacement parts shall be of equal or better quality as original equipment and suitable for the purpose. In the event deficiencies remain uncorrected and no certification therefore is issued, the accredited person shall inform of the circumstances the nearest district office of the department of labor and industries.

[Order 74-25, § 296-304-20025, filed 5/7/74.]

### Chapter 296-305 WAC

#### SAFETY STANDARDS FOR FIRE FIGHTERS

##### WAC

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296-305-07011	Occupant restraints and enclosures for wildland fire fighting.
296-305-07013	Equipment for wildland fire fighting.
296-305-07015	Aircraft operations for fighting wildland fires.
296-305-07017	First aid for wildland fire fighters.
296-305-07019	Training for wildland fire fighting.
296-305-08000	Appendices.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-305-001	Foreword. [Order 77-20, § 296-305-001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-003	Effective date. [Order 77-20, § 296-305-003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-005	Scope and application. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-005, filed 11/30/83. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 78-09-092 (Order 78-16), § 296-305-005, filed 8/31/78; Order 77-20, § 296-305-005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-007	Definitions. [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-007, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-007, filed 11/30/83; Order 77-20, § 296-305-007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-010	Variance and procedure. [Order 77-20, § 296-305-010, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-015	Injury and illness report for fire fighters. [Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-305-015, filed 8/13/90, effective 9/24/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-015, filed 11/30/83; Order 77-20, § 296-305-015, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-017	Accident investigation. [Order 77-20, § 296-305-017, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-020	Accident prevention programs. [Order 77-20, § 296-305-020, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-025	Management's responsibility. [Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-305-025, filed 8/3/94, effective 9/12/94; 91-24-017 (Order 91-07), § 296-305-025, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-305-025, filed 5/15/89, effective 6/30/89; Order 77-20, § 296-305-025, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-030	Employee's responsibility. [Order 77-20, § 296-305-030, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067,

	filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06309	Respiratory protection equipment maintenance and repair. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06309, filed 11/30/83; Order 77-20, § 296-305-06309, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-035	Safe place standards. [Order 77-20, § 296-305-035, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.		
296-305-040	First-aid training and certification. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-040, filed 11/30/83; Order 77-20, § 296-305-040, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06311	Respiratory equipment training. [Order 77-20, § 296-305-06311, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-045	First-aid kits. [Order 77-20, § 296-305-045, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06313	Filling air cylinders. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06313, filed 11/30/83.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-060	Personal protective equipment and clothing. [Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-060, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-060, filed 11/30/83; Order 77-20, § 296-305-060, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-064	Fire overhaul. [Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-064, filed 7/6/88.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-06009	Body protection. [Statutory Authority: Chapter 49.17 RCW, 91-11-070 (Order 91-01), § 296-305-06009, filed 5/20/91, effective 6/20/91. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06009, filed 11/30/83; Order 77-20, § 296-305-06009, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-065	Requirements for fire stations. [Order 77-20, § 296-305-065, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-06011	Head protection. [Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-06011, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06011, filed 11/30/83; Order 77-20, § 296-305-06011, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-070	Automotive fire apparatus. [Order 77-20, § 296-305-070, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-063	Respiratory equipment. [Statutory Authority: Chapter 49.17 RCW, 91-24-017 (Order 91-07), § 296-305-063, filed 11/22/91, effective 12/24/91; 88-14-108 (Order 88-11), § 296-305-063, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-063, filed 11/30/83; Order 77-20, § 296-305-063, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-075	Fire service equipment. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-075, filed 11/30/83; Order 77-20, § 296-305-075, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-06301	Respiratory equipment effective dates. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06301, filed 11/30/83; Order 77-20, § 296-305-06301, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.	296-305-080	Testing fire service equipment. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-080, filed 11/30/83; Order 77-20, § 296-305-080, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-06303	Respiratory equipment approvals. [Order 77-20, § 296-305-06303, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.	296-305-085	Fire combat training. [Order 77-20, § 296-305-085, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-06305	Respiratory equipment inspection. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06305, filed 11/30/83; Order 77-20, § 296-305-06305, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.	296-305-090	Operations. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-090, filed 11/30/83; Order 77-20, § 296-305-090, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-06307	Respiratory equipment testing. [Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06307, filed 11/30/83; Order 77-20, § 296-305-06307, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.	296-305-095	Fire overhaul. [Order 77-20, § 296-305-095, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
		296-305-9901	Testing extension ladders—Figure 14. [Order 77-20, Illustration (codified as WAC 296-305-9901), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
		296-305-9902	Testing extension ladders—Figure 15. [Order 77-20, Illustration (codified as WAC 296-305-9902), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
		296-305-9903	Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9903), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
		296-305-9904	Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9904), filed

- 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9905 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9905), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9906 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9906), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-100 Ladders. [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-100, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-100, filed 11/30/83; Order 77-20, § 296-305-100, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-105 Aerial ladders. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-105, filed 11/30/83; Order 77-20, § 296-305-105, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-110 Elevated platforms. [Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-305-110, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-110, filed 11/30/83; Order 77-20, § 296-305-110, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-115 Electrical. [Order 77-20, § 296-305-115, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.

**WAC 296-305-01001 Foreword.** These fire fighter safety and health standards were adopted by the department of labor and industries in accordance with the provisions of the Washington Industrial Safety and Health Act (WISHA) of 1973 (chapter 49.17 RCW), with recommendations from the fire service advisory committee.

The purpose of this chapter is to assist employers and employees in the reduction of work related injuries and illnesses. In addition to providing an enforceable set of safety and health standards for the fire protection services, it is the intent of the department that the provisions of this chapter be used to assist both employers and employees in achieving the safest workplace reasonably attainable under the conditions to which employees are or will be exposed.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01001, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01002 Effective date.** Unless a particular provision of this chapter specifies otherwise, the effective date of chapter 296-305 WAC, shall be January 1, 1997.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01002, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01003 Scope and application.** (1) The rules of this chapter shall apply with respect to any and all activities, operations and equipment of employers and

employees involved in providing fire protection services which are subject to the provisions of the Washington Industrial Safety and Health Act of 1973 (chapter 49.17 RCW).

(2) The provisions of this chapter apply to all fire fighters and their work places, including the fire combat scene. Although enforcement of applicable standards will result from provable violations of these standards at the fire combat scene, agents of the department will not act in any manner that will reduce or interfere with the effectiveness of the emergency response of a fire fighting unit. Activities directly related to the combating of a fire will not be subjected to the immediate restraint provisions of RCW 49.17.130.

(3) In the development of this document many consensus standards of the industry were considered and evaluated as to adaptability to the Washington state fire service industry. Where adaptable and meaningful, the fire fighter safety elements of these standards were incorporated into this WAC. Chapter 296-305 WAC, shall be considered as the fire fighter safety standards for the state of Washington.

(4) The provisions of this chapter cover existing requirements that apply to all fire departments. All fire departments shall have in place their own policy statement and operating instructions that meet or exceed these requirements. This chapter contains state and/or federal performance criteria that fire departments shall meet.

(5) Unless specifically stated otherwise by rule, if a duplication of regulations, or a conflict exists between the rules regulating wildland fire fighting and other rules in the chapter, only the rules regulating wildland fire fighting shall apply to wildland fire fighting activities and equipment.

(6) The provisions of this chapter shall be supplemented by the provisions of the general safety and health standards of the department of labor and industries, chapters 296-24, 296-62, 296-800, and 296-811 WAC. In the event of conflict between any provision(s) of this chapter and any provision(s) of the general safety and health standards, the provision(s) of this chapter shall apply.

(7) The provisions of this standard do not apply to industrial fire brigades, as defined in this chapter. Industrial fire brigades are covered under the provisions of chapter 296-811 WAC, Fire brigades.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-305-01003, filed 12/20/05, effective 3/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-01003, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-01003, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01003, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01005 Definitions.** Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

**Accident:** An unexpected event that interrupts or interferes with the orderly progress of the fire department operations and may or may not include personal injury or property damage.

**Accountability system:** A system of fire fighter accountability that provides for the tracking and inventory of all members.

**ACGIH:** American Conference of Governmental Industrial Hygienists.

**Aerial ladder:** A ladder mounted on top of an apparatus, hydraulic or pneumatic controlled.

**Aerial tower:** Telescopic elevating platform or water tower assembly usually with a ladder on top of the section.

**Aerial platform:** A device consisting of two or more booms or sections with a passenger carrying platform assembly.

**ANSI:** American National Standards Institute.

**Apparatus:** A mobile piece of fire equipment such as a pumper, aerial, tender, automobile, etc.

**Approved:**

(1) A method, equipment, procedure, practice, tool, etc., which is sanctioned, consented to, confirmed or accepted as good or satisfactory for a particular purpose or use by a person, or organization authorized to make such a judgment.

(2) Means approved by the director of the department of labor and industries or his/her authorized representative: Provided, however, That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the Bureau of Mines, the provisions of chapter 296-800 WAC shall apply.

**Audiogram:** A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**Authorized person:** A person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

**Beacon:** A flashing or rotating light.

**Bloodborne pathogens:** Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

**Blowup (wildfire):** Sudden increase in fire intensity or rate of spread sufficient to preclude direct control or to upset existing control plans. Often accompanied by violent convection and may have other characteristics of a fire storm.

**Chemical-protective clothing:** Items made from chemical-resistive materials, such as clothing, hood, boots, and gloves, that are designed and configured to protect the wearer's torso, head, arms, legs, hands, and feet from hazardous materials. Chemical-protective clothing (garments) can be constructed as a single, or multipiece, garment. The garment may completely enclose the wearer either by itself or in combination with the wearer's respiratory protection, attached or detachable hood, gloves, and boots.

**Chief:** The employer representative highest in rank who is responsible for the fire department's operation.

**Combat scene:** The site where the suppression of a fire or emergency exists.

**Confinement:** Those procedures taken to keep a material in a defined or local area.

**Confined space:** Means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and

(3) Is not designed for continuous employee occupancy.

**Containment:** The actions taken to keep a material in its container (e.g. stop the release of the material or reduce the amount being released.)

**Contaminated:** The presence or the reasonably anticipated presence of nuisance materials foreign to the normal atmospheres, blood, hazardous waste, or other potentially infectious materials on an item or surface.

**Contaminated laundry:** Laundry which has been soiled with blood or other potentially infectious materials or may contain contaminated sharps.

**Contamination:** The process of transferring a hazardous material from its source to people, animals, the environment, or equipment, which may act as a carrier.

**dBA:** A measure of noise level expressed as decibels measured on the "A" scale.

**Deck pipe:** A permanently mounted device which delivers a large stream of water.

**Decontamination:**

(1) The physical or chemical process of reducing and preventing the spread of contamination from persons or equipment used at a hazardous materials incident.

(2) The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

**Department:** Department of labor and industries.

**Director of fire department:** The chief or principle administrator of the fire department.

**Director:** The director of the department of labor and industries, or his/her designated representative.

**Disinfection:** A procedure which inactivates virtually all recognized pathogenic microorganisms, but not necessarily all microbial forms (example: bacterial endospores) on inanimate objects.

**Drill tower:** A structure which may or may not be attached to the station and which is principally used for training fire fighters in fire service techniques.

**Driver:** A person having satisfactorily completed the fire department's "requirements of driver" of a specific piece of fire apparatus.

**Emergency:** A sudden and unexpected event calling for immediate action.

**Emergency incident:** A specific emergency operation.

**Emergency medical care:** The provision of treatment to, and/or transportation of, patients which may include first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other medical procedures that occur prior to arrival at a hospital or other health care facility.

**Emergency operations:** Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of an incident and all functions performed at the scene.

**Employee:** An employee of an employer who is employed in the business of his/her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is their personal labor for an employer under this chapter whether by way of manual labor or otherwise. Also see "Member."

**Employer:** Any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations.

**Employer representative:** A fire department officer authorized by the chief or director of the fire department to act in his/her behalf.

**Engine (pumper):** A piece of apparatus equipped with hose and a pump for the purpose of supplying water under pressure through hose lines.

**Engineering control:** Any procedure other than an administrative control that reduces exposures by modifying the source or reducing the exposure to an individual. Examples of engineering controls include the use of isolation, containment, encapsulation, sound absorbing materials for noise control, and ventilation.

**Explosion proof equipment:** Equipment enclosed in a case that is capable of withstanding an explosion or a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

**Fastest means available:** The (nearest-closest) telephone, portable radio, mobile radio, telephone/radio dispatcher or any other mode of mechanical communication.

**Fire apparatus:** A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions.

**Fire boat:** A fire department watercraft having a permanent, affixed fire fighting capability.

**Fire combat training:** Training received by fire fighters on the drill ground, drill tower, or industrial site to maintain the fire fighter's proficiency.

**Fire department:** An organization providing any or all of the following: Rescue, fire suppression, and other related activities. For the purposes of this standard the term "Fire Department" shall include any public, private, or military organization engaging in this type of activity.

**Fire department facility:** Any building or area owned, operated, occupied, or used by a fire department on a routine basis. This does not include locations where a fire department may be summoned to perform emergency operations or other duties, unless such premises are normally under the control of the fire department.

**Fire department safety officer:** The member of the fire department assigned and authorized as the principal safety officer to perform the duties and responsibilities specified in this standard.

**Fire fighter:** A member of a fire department whose duties require the performance of essential fire fighting functions or substantially similar functions.

**Fire retardant:** Any material used to reduce, stop or prevent the flame spread.

**Fly:** Extendible sections of ground or aerial ladders.

**Foot stand, ladder:** Devices attached to inside of beams of ladders that when folded down, provide foot space.

**Ground jack:** Heavy jacks attached to frame of chassis of aerial-equipped apparatus to provide stability when the aerial portion of the apparatus is used.

**Ground mobile attack:** The activities of wildland fire fighting with hose lines being used by personnel working around a moving engine. See mobile attack.

**Guideline:** An organizational directive that establishes a standard course of action.

**Halyard:** Rope used on extension ladders for the purpose of raising or lowering fly section(s). A wire cable may be referred to as a halyard when used on the uppermost fly section(s) of three or four section extension ladders.

**Hazard communication program:** A procedure to address comprehensively the issue of evaluating the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees. See WAC 296-800-170, Chemical Hazard Communication Program.

**Hazardous area:** The immediate area where members might be exposed to a hazard.

**Hazardous atmosphere:** Any atmosphere, either immediately or not immediately dangerous to life or health, which is oxygen deficient or which contains a toxic or disease-producing contaminant.

**Hazardous condition:** The physical condition or act which is causally related to accident occurrence. The hazardous condition is related directly to both the accident type and the agency of the accident.

**Hazardous material:** A substance (solid, liquid, or gas) that when released is capable of creating harm to people, the environment, and property.

**Hazardous substances:** Substances that present an unusual risk to persons due to properties of toxicity, chemical activity, corrosivity, etiological hazards of similar properties.

**HEPA filtration:** High efficiency particulate air filtration found in vacuum system capable of filtering 0.3 micron particles with 99.97% efficiency.

**Hose bed:** Portion of fire apparatus where hose is stored.

**Hose tower:** A vertical enclosure where hose is hung to dry.

**Hot zone:** Area immediately surrounding a hazardous materials incident, which extends far enough to prevent adverse effects from hazardous materials releases to personnel outside the zone. This zone is also referred to as the exclusion zone or the restricted zone in other documents.

**Identify:** To select or indicate verbally or in writing using recognized standard terms. To establish the identity of; the fact of being the same as the one described.

**IDLH:** Immediately dangerous to life and health.

**Imminent hazard (danger):** An act or condition that is judged to present a danger to persons or property and is so immediate and severe that it requires immediate corrective or preventative action.

**Incident commander:** The person in overall command of an emergency incident. This person is responsible for the direction and coordination of the response effort.

**Incident command system (ICS):** A system that includes: Roles, responsibilities, operating requirements,

guidelines and procedures for organizing and operating an on-scene management structure.

**Incipient (phase) fire:** The beginning of a fire; where the oxygen content in the air has not been significantly reduced and the fire is producing minute amounts of water vapor, carbon dioxide, carbon monoxide and other gases; the room has a normal temperature and can be controlled or extinguished with a portable fire extinguisher or small hose, e.g., a kitchen stove fire.

**Industrial fire brigade:** An organized group of employees whose primary employment is other than fire fighting who are knowledgeable, trained and skilled in specialized operations based on site-specific hazards present at a single commercial facility or facilities under the same management.

**Initial stage (initial action):** Shall encompass the control efforts taken by resources which are first to arrive at an incident.

**Injury:** Physical damage suffered by a person that requires treatment by a practitioner of medicine (a physician, nurse, paramedic or EMT) within one year of the incident regardless of whether treatment was actually received.

**Interior structural fire fighting:** The physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. See structural fire fighting.

**Life safety or rescue rope:** Rope dedicated solely for the purpose of constructing lines for supporting people during rescue, fire fighting, or other emergency operations, or during training evolutions.

**Line:** Rope when in use.

**Live fire training:** Any fire set within a structure, tank, pipe, pan, etc., under controlled conditions to facilitate the training of fire fighters under actual fire conditions.

**Locking in:** The act of securing oneself to a ladder by hooking a leg over a rung and placing top of foot against the other leg or against the ladder.

**Manned station:** See staffed station.

**May:** A permissive use or an alternative method to a specified requirement.

**Member:** A person involved in performing the duties and responsibilities of a fire department under the auspices of the organization. A fire department member may be a full-time or part-time employee or a paid or unpaid volunteer, may occupy any position or rank within the fire department, and engages in emergency operations. Also see Employee.

**Mobile attack:** The act of fighting wildland fires from a moving engine.

**Monitor:** A portable appliance that delivers a large stream of water.

**Mop up:** The act of making a wildfire/wildland fire safe after it is controlled, such as extinguishing or removing burning materials along or near the control line, felling snags, trenching logs to prevent rolling.

**NFPA:** National Fire Protection Association.

**NIIMS:** National Interagency Incident Management System.

**NIOSH:** National Institute of Occupational Safety and Health.

**Nondestructive testing:** A test to determine the characteristics or properties of a material or substance that does not involve its destruction or deterioration.

**Nonskid:** The surface treatment that lessens the tendency of a foreign substance to reduce the coefficient of friction between opposing surfaces.

**Occupational exposure:** Means reasonably anticipated skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

**Officer:** (1) Person in charge of a particular task or assignment.

(2) A supervisor.

**OSHA:** Occupational Safety and Health Administration.

**Other potentially infectious materials (OPIM):** (1) The following body fluids: Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;

(2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and

(3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

**Outrigger:** Manually or hydraulically operated metal enclosures and jacks which are extended and placed in contact with the ground to give the apparatus a wide, solid base to support different loads.

**Overhauling:** That portion of fire extinguishment involving discovery of hidden fires or smoldering material.

**PASS:** Personal alert safety system.

**PEL:** Permissible exposure limit.

**Personal protective equipment (PPE):** (1) The equipment provided to shield or isolate a person from the chemical, physical, and thermal hazards that may be encountered at a hazardous materials incident. Personal protective equipment includes both personal protective clothing and respiratory protection. Adequate personal protective equipment should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

(2) Specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

**Place of employment:** Any premises, room or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control. For the purposes of this code, fireground and emergency scenes are also considered places of employment.

**Platform:** The portion of a telescoping or articulating boom used as a working surface.

**Positive communication:** Visual, audible, physical, safety guide rope, or electronic means which allows for two way message generation and reception.

**PPE:** Personal protective equipment.

**Prefire training:** The training of fire fighters in recognizing sources and locations of potential fires and the method of fire combat to be used.

**Probable fatality:** (1) An occupational injury or illness, which, by the doctor's prognosis, could lead to death.

(2) An occupational injury or illness, which by its very nature, is considered life threatening.

**Protective clothing:** Equipment designed to protect the wearer from heat and/or hazardous materials contacting the skin or eyes. Protective clothing is divided into five types:

- (1) Structural fire fighting protective clothing;
- (2) Liquid splash-protective clothing;
- (3) Vapor-protective clothing;
- (4) High temperature-protective proximity clothing; and
- (5) Wildland fire fighting clothing.

Note: See Protective ensemble.

**Protective ensemble:** Multiple elements of clothing and equipment designed to provide a degree of protection for fire fighters from adverse exposures to the inherent risks of structural fire fighting operations and certain other emergency operations. The elements of the protective ensemble are helmets, coats, trousers, gloves, footwear, interface components (hoods), and if applicable, personal alert system (PASS) devices, and self-contained breathing apparatus.

**Proximity protective clothing:** Radiant reflective protective garments configured as a coat and trousers, or as a coverall, and interface components that are designed to provide protection for the fire fighter's body from conductive, convective, and radiant heat.

**Pumper:** See engine.

**Qualified:** One who by possession of a recognized degree, certificate or professional standing, or who by knowledge, training or experience has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work or the project.

**Rapid intervention team (RIT):** On-scene team of at least two members designated, dedicated and equipped to effect an immediate rescue operation if the need arises.

**RCW:** Revised Code of Washington.

**Rescue:** Those activities directed at locating endangered persons at an emergency incident and removing those persons from danger.

**Rescue craft:** Any fire department watercraft used for rescue operations.

**Respirator:** A device designed to protect the wearer from breathing harmful atmospheres. See respiratory protection.

**Respiratory equipment:** Self-contained breathing apparatus designed to provide the wearer with a supply of respirable atmosphere carried in or generated by the breathing apparatus. When in use, this breathing apparatus requires no intake of air or oxygen from the outside atmosphere.

(1) Respirators (closed circuit): Those types of respirators which retain exhaled air in the system and recondition such air for breathing again.

(2) Respirators (open circuit): Those types of respirators which exhaust exhaled air to the outside of the mask into the ambient air.

(3) Respirators (demand): Those types of respirators whose input air to the mask is started when a negative pressure is generated by inhalation.

(4) Respirators (pressure demand): Those types of respirators which constantly and automatically maintain a positive pressure in the mask by the introduction of air when the positive pressure is lowered (usually from .018 psi to .064 psi) through the process of inhalation or leakage from the mask.

**Respiratory protection:** Equipment designed to protect the wearer from the inhalation of contaminants. Respiratory protection is divided into three types:

- (1) Positive pressure self-contained breathing apparatus (SCBA);
- (2) Positive pressure airline respirators;
- (3) Negative pressure air purifying respirators.

**Responding:** The usual reference to the act of responding or traveling to an alarm or request for assistance.

**Risk assessment:** To set or determine the possibility of suffering harm or loss, and to what extent.

**Safe and healthful working environment:** The work surroundings of an employee with minimum exposure to unsafe acts and/or unsafe conditions.

**Safety officer:** Either the fire department safety officer or an assistant safety officer (see fire department safety officer).

**Safety net:** A rope or nylon strap net not to exceed 6-inch mesh, stretched and suspended above ground level at the base of drill tower, and at such a height that a falling body would be arrested prior to striking the ground.

**Scabbard:** A guard which will prevent accidental injury and covers the blade and pick of an axe or other sharp instrument when worn by the fire fighter.

**SCBA:** Self contained breathing apparatus.

**Service testing:** The regular, periodic inspection and testing of apparatus and equipment according to an established schedule and procedure, to insure that it is in safe and functional operating condition.

**Shall:** Mandatory.

**Should:** Recommended.

**Signalman:** A person so positioned that he/she can direct the driver when the drivers vision is obstructed or obscured.

**SOP:** Standard operating procedure or guidelines.

**Staffed station:** A fire station continuously occupied by fire fighters on scheduled work shifts. The staffed station may also serve as headquarters for volunteers.

**Standard operating procedure or guidelines:** An organizational directive that establishes a standard course of action. See SOP.

**Station (fire station):** Structure in which fire service apparatus and/or personnel are housed.

**Structural fire fighting:** The activities of rescuing, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, or similar properties that are involved in a fire or emergency situation. See interior structural fire fighting.

**Structural fire fighting protective clothing:** This category of clothing, often called turnout or bunker gear, means the protective clothing normally worn by fire fighters during structural fire fighting operations. It includes a helmet, coat, pants, boots, gloves, and a hood. Structural fire fighters' pro-

protective clothing provides limited protection from heat but may not provide adequate protection from the harmful gases, vapors, liquids, or dusts that are encountered during hazardous materials incidents.

**Support function:** A hazardous chemical operation involving controlled chemical uses or exposures in nonflammable atmospheres with minimum threats in loss of life, personnel injury, or damage to property or to the environment. Functions include decontamination, remedial cleanup of identified chemicals, and training.

**Support function protective garment:** A chemical-protective suit that meets the requirements of NFPA Standard on Support Function Garments, 1993.

**Tail/running board:** Standing space on the side or rear of an engine or pumper apparatus.

**Team:** Two or more individuals who are working together in positive communication with each other through visual, audible, physical, safety guide rope, electronic, or other means to coordinate their activities and who are in close proximity to each other to provide assistance in case of emergency.

**Tillerman:** Rear driver of tractor-trailer aerial ladder.

**Trench:** A narrow excavation made below the surface of the ground. The depth is generally greater than the width, but the width of a trench is not greater than 15 feet.

**Turnout clothing:** See structural fire fighting protective clothing.

**Turntable:** The rotating surface located at the base of an aerial ladder, or boom, on aerial apparatus.

**Universal precaution:** An approach to infection control. According to the concept of universal precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

**Vapor barrier:** Material used to prevent or substantially inhibit the transfer of water, corrosive liquids and steam or other hot vapors from the outside of a garment to the wearer's body.

**Variance:** An allowed or authorized deviation from specific standard(s) when an employer substitutes measures which afford an equal degree of safety. Variances are issued as temporary or permanent with interim measures issued, when requested, until a determination or decision is made.

**Vessel:** Means every description of watercraft or other artificial contrivance used or capable of being used as a means of transportation on water, including special-purpose floating structures not primarily designed for or used as a means of transportation on water.

**WAC:** Washington Administrative Code.

**Wheel blocks (chocks):** A block or wedge placed under a wheel to prevent motion.

**Wildfire:** An unplanned and unwanted fire requiring suppression action; an uncontrolled fire, usually spreading through vegetative fuels and often threatening structures.

**Wildland fire:** A fire burning in natural vegetation that requires an individual or crew(s) to expend more than one hour of labor to confine, control and extinguish. Agencies may substitute crews to avoid the one hour bench mark or increase crew size to complete the job in less than one hour. One hour was chosen as the maximum time that individuals

should work in high temperatures in structural protective clothing.

**Wildland fire fighting enclosure:** A fire apparatus enclosure with a minimum of three sides and a bottom.

**WISHA:** Washington Industrial Safety Health Act.

**Work environment:** The surrounding conditions, influences or forces to which an employee is exposed while working.

**Workplace:** See place of employment.

**WRD:** WISHA regional directive.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-01005, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-01005, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01005, filed 5/10/96, effective 1/1/97.]

### WAC 296-305-01007 Variance and procedure. (1)

Conditions may exist in operations that a state standard will not have practical use. The director may issue a variance from the requirements of the standard when another means of providing equal protection is provided.

(2) Applications for variances will be reviewed and investigated by the department. Variances granted shall be limited to the specific WAC code covered in the application and may be revoked for cause. The variance shall remain prominently posted on the premises while in effect.

Note: Variance forms may be obtained from the department upon request. Requests for variance from safety and health standards shall be made in writing to the assistant director, Consultation and Compliance Services Division, Department of Labor and Industries, P.O. Box 44600, Olympia, Washington 98504-4600. (Reference RCW 49.17.080 and 49.17-090.)

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 295-305-01007, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01009 Appeals.** Any party authorized to appeal from an action of the department as set forth in RCW 49.17.140(3), may do so by filing a notice of appeal in writing. The appeal must contain the recommended subject matter, as noted below, by serving a copy of such notice of appeal either in person or by mail upon the assistant director of the Consultation and Compliance Services Division, (7273 Linderson Way, Tumwater, Washington) P.O. Box 44600, Olympia, Washington 98504-4600. The appeal must be sent to the department within fifteen working days of the communication of the notice.

The notice of appeal should contain:

- (1) The name and address of the appealing party and his/her representative if any;
- (2) The place where the alleged safety violation occurred;
- (3) A statement identifying the order, decision or citation appealed from, by report number and date of issuance;
- (4) The grounds upon which the appealing party considers such order, decision, or citation to be unjust or unlawful;
- (5) A statement of facts in support of each grounds stated;
- (6) The relief sought, including the specific nature and extent;
- (7) A statement that the person signing the notice of appeal has read it and to the best of his/her knowledge, infor-

mation and belief there is good ground to support it. A notice of appeal may be signed by the party or by his/her authorized representative.

References:

WAC 296-800-350, Inspections, citations and appeals—Contents RCW 49.17.140(3).

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-01009, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01009, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01501 Injury and illness reports for fire fighters.** (1) Notice of injury or illness.

(a) Whenever an occupational accident causes injury or illness to a fire fighter or other employee, or whenever a fire fighter or other employee becomes aware of an illness apparently caused by occupational exposure, it shall be the duty of such a fire fighter or other employee, or someone on his/her behalf, to report the injury or illness to the employer before the end of his/her duty period but not later than twenty-four hours after the incident.

(b) Exception: In the event that symptoms of an occupational injury or illness are not apparent at the time of the incident, the employee shall report the symptoms to his/her employer within forty-eight hours after becoming aware of the injury or illness.

(c) Within eight hours after the fatality or probable fatality of any fire fighter or employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected, shall orally report the fatality/multiple hospitalization by telephone or in person, to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(i) This requirement applies to each such fatality or hospitalization of two or more employees which occurs within thirty days of the incident.

(ii) Exception: If any employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time the incident is reported to any agent or employee of the employer.

(iii) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.

(2) Recordkeeping - written reports; all fire service employers shall maintain records of occupational injuries and illnesses. Reportable cases include every occupational death, every occupational illness, or each injury that involves one of the following: Unconsciousness, inability to perform all phases of regular duty-related assignment, inability to work full time on duty, temporary assignment, or medical treatment beyond first aid.

(3) All fire departments shall record occupational injury and illnesses on forms OSHA 101-Supplementary Record Occupational Injuries and Illnesses and OSHA 200-Log summary. Forms other than OSHA 101 may be substituted for the

Supplementary Record of Occupational Injuries and Illnesses if they contain the same items.

(4) Each employer shall post an annual summary of occupational injuries and illnesses for each establishment. This summary shall consist of a copy of the year's totals from the Form OSHA No. 200 and the following information from that form: Calendar year covered, company name, establishment name, establishment address, certification signature, title, and date. A Form OSHA No. 200 shall be used in presenting the summary. If no injuries or illnesses occurred in the year, zeros must be entered on the totals line, and the form must be posted. The summary shall be completed by February 1 each calendar year. The summary covering the previous calendar year shall be posted no later than February 1, and shall remain in place until March 1.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01501, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01503 Accident investigation.** (1)

After the emergency actions following accidents that cause serious injuries that have immediate symptoms, a preliminary investigation of the cause of the accident shall be conducted. The investigation shall be conducted by a person designated by the employer. The fire department shall establish a written procedure and a program for investigating, and evaluating the facts, relating to the cause of accidents. The findings of the investigation shall be documented by the employer for reference at any following formal investigations.

(2) Within eight hours after the fatality or probable fatality of any fire fighter or employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected, shall orally report the fatality/multiple hospitalization by telephone or in person, to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(3) Equipment involved in an accident resulting in an immediate or probable fatality, shall not be moved, until a representative of the consultation and compliance services division investigates the accident and releases such equipment, except where removal is essential to prevent further accident. When necessary to remove the victim, such equipment may be moved only to the extent of making possible such removal.

(4) Upon arrival of the department's investigator, the employer shall assign to assist the investigator such personnel as are deemed necessary by the department to conduct the investigation.

(5) The fire department shall preserve all records, photographic materials, audio, video, recordings, or other documentation concerning an accident.

Reference: WAC 296-24-020 (2), (3).

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01503, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01505 Accident prevention program.**

(1) All fire departments shall develop and implement a written safety program.

(2) Fire department safety programs shall have an assigned safety officer.

(3) Each employer shall develop a formal accident-prevention program, tailored to the needs of the fire department and to the type of hazards involved. The department of labor and industries' consultation and compliance services division may be contacted for assistance in developing appropriate programs.

(a) A safety orientation program describing the employer's safety program shall include:

(i) How and when to report injuries, including instruction as to the location of first-aid facilities.

(ii) How to report unsafe conditions and practices.

(iii) The use and care of required personal protective equipment.

(iv) The proper actions to take in event of emergencies including the routes of exiting from areas during emergencies.

(v) Identification of the hazardous gases, chemicals or materials involved, along with the instructions on the safe use and emergency action following accidental exposure.

(vi) A description of the employer's total safety program.

(vii) An on-the-job review of the practices necessary to perform the initial job assignments in a safe manner.

(4) Fire departments shall have a safety committee to serve in an advisory capacity to the fire chief. The number of employer-selected members shall not exceed the number of employee-elected members.

(5) The frequency of safety meetings shall be determined by the safety committee, but shall not be less than one hour per calendar quarter, however, special meetings may be held at the request of either party.

(6) Minutes shall be taken of all safety meetings. After review by the chief or his/her designee the minutes shall be conspicuously posted at all stations.

(7) Employee submitted written suggestions or complaints shall be considered. Action recommendations by the committee shall be transmitted in writing to the fire chief. The chief or his/her designated agent will reply to the submitter.

(8) Inspections of fire stations shall be made at least monthly and records maintained to ensure that stations are reasonably free of recognized hazards. These inspections shall include, but not be limited to, tools, apparatus, extinguishers, protective equipment, and life safety equipment.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01505, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01507 Fire department safety officer.**

(1) The duties and responsibilities of the fire department safety officer shall include, but are not limited to:

(a) Plan and coordinate safety activities.

(b) Work closely with the safety committee.

(c) Ensure accidents are investigated.

(d) Devise corrective measures to prevent accidents.

(2) Realizing safety training and recordkeeping are management's responsibility, the fire department safety officer shall ensure the following requirements are being met:

(a) Ensure safety training for all employees.

(b) Ensure safety directives are complied with.

(c) Ensure that records are kept, but not limited to the following:

(i) Accidents

(ii) Injuries

(iii) Inspections

(iv) Exposures

(v) Medical Monitoring

(vi) Safety meetings

(vii) Apparatus

(viii) Equipment

(ix) Protective clothing

(x) Other fire department safety activities

(3) The fire department safety officer, through the fire chief, shall have the authority and responsibility to identify and recommend correction of safety and health hazards.

(4) The fire department safety officer shall maintain a liaison with staff officers regarding recommended changes in equipment, procedures, and recommended methods to eliminate unsafe practices and reduce existing hazardous conditions.

Additional Reference: NFPA 1521 Standard for Fire Department Safety Officer, may be used as a guide for duties and responsibilities relating to the safety officer.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01507, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01509 Management's responsibility.**

(1) It shall be the responsibility of management to establish, supervise, maintain, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment, as it applies to noncombat conditions or to combat conditions at a fire scene after the fire has been extinguished, as determined by the officer in charge.

(b) An accident prevention program as required by this chapter.

(c) Programs for training employees in the fundamentals of accident prevention.

(d) Procedures to be used by the fire department safety officer and incident commander to ensure that emergency medical care is provided for members on duty.

(e) An accident investigation program as required by this chapter.

(2) The fire department shall be responsible for providing suitable expertise to comply with all testing requirements in this chapter. Such expertise may be secured from within the fire department, from equipment and apparatus manufacturers, or other suitable sources.

(3) Members who are under the influence of alcohol or drugs shall not participate in any fire department operations or other functions. This rule does not apply to persons taking prescription drugs as directed by a physician or dentist providing such use does not endanger the worker or others.

(4) Alcoholic beverages shall not be allowed in station houses, except at those times when station houses are used as community centers, with the approval of management.

(5) A bulletin board or posting area exclusively for safety and health and large enough to display the required safety and health posters. The WISHA poster (WISHA form F416-081-000) and other safety education material shall be provided. A bulletin board of "white background" and "green trim" is recommended.

(6) The fire department shall develop and maintain a hazard communication program as required by WAC 296-

800-170, which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may routinely be exposed to, in the course of their employment.

(7) Personnel.

(a) The employer shall assure that employees who are expected to do interior structural fire fighting are physically capable of performing duties that may be assigned to them during emergencies.

(b) The employer shall not permit employees with known physical limitations reasonably identifiable to the employer, for example, heart disease or seizure disorder, to participate in structural fire fighting emergency activities unless the employee has been released by a physician to participate in such activities.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-01509, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-01509, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01509, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01511 Employee's responsibility.** (1) Fire fighters shall cooperate with the employer and other employees in efforts to eliminate accidents.

(2) Each fire fighter or other employee shall comply with the provisions of this chapter which are applicable to his/her own actions and conduct in the course of his/her employment.

(3) Fire fighters and other employees shall notify the appropriate employer representative of unsafe work practices and of unsafe conditions of equipment, apparatus, or work places.

(4) Fire fighters and other employees shall apply the principles of accident prevention in their work. They shall use all required safety devices, protective equipment, and safety practices, as provided and/or developed by management.

(5) Each fire fighter shall take proper care of all personal protective equipment.

(6) Fire fighters shall attend, when on duty, required training and/or orientation programs designed to increase their competency in occupational safety and health.

(7) Fire fighters who are under the influence of alcohol or drugs shall not participate in any fire department operations or other functions. This rule does not apply to persons taking prescription drugs as directed by a physician or dentist providing such use does not endanger the worker or others.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01511, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01513 Safe place standards.** (1) Every employer shall furnish and require the use of appropriate safety devices and safeguards. All fire fighting methods, and operations shall be so designed as to promote the safety and health of employees. The employer shall do everything reasonably necessary to protect the safety and health of employees.

(2) No fire fighter or other employee, employer or employer representative shall:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice or warning furnished for use in any employment or place of employment.

(b) Interfere in any way with the use of any safety device, method or process adopted for the protection of any employee.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01513, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01515 First-aid training and certification.** (1) All fire fighters except directors of fire departments and the directors' designated personnel, shall have as a minimum first-aid training as evidenced by a current, valid first-aid card, EMT or First Responder certification.

(2) New fire fighters shall have such first-aid training within 90 days of the date of their employment or enroll for training in the next available class for which they are eligible.

(3) Fire service duties include exposure to bloodborne pathogens. The requirements of this section and chapter 296-823 WAC, Occupational exposure to bloodborne pathogens, shall apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-07-160, § 296-305-01515, filed 3/23/04, effective 5/1/04; 03-09-110, § 296-305-01515, filed 4/22/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-01515, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01515, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-01517 First-aid kits.** (1) To assure the emergency medical care of the fire fighters there shall be present at each emergency incident at least the following items:

- 1 (one) utility scissors, EMT-type
- 1 CPR barrier
- 3 (three) rolls 1 inch adhesive tape
- 6 (six) 4" x 4" sterile, individually wrapped gauze pads
- 4 (four) combination pads, sterile, individually wrapped
- 4 (four) soft roller bandages, assorted size, sterile, individually wrapped cling type
- 2 (two) burn sheets, sterile, individually wrapped
- 2 (two) triangular bandages
- 1 (one) multitrauma dressing, sterile
- 2 (two) supply disposable gloves
- 2 (two) wire splints or equivalent
- (2) All fire stations shall maintain a first-aid kit. The kit shall contain at least the following items:
  - 6 (six) 4" x 4" sterile, individually wrapped gauze pads
  - 4 (four) combination pads, sterile, individually wrapped
  - 2 (two) rolls 1 inch adhesive tape
  - 4 (four) soft roller bandages, assorted size, sterile, individually wrapped cling type
  - 2 (two) triangular bandages
  - 1 (one) utility scissors, EMT-type
  - 1 (one) pair tweezers
  - 1 (one) package assorted adhesive bandages

(3) All fire apparatus shall contain a first-aid kit as described in WAC 296-800-150.

(4) All fire departments providing emergency medical services to the public shall conform to the requirements of chapter 18.73 RCW Emergency Care and Transportation Services (and if applicable, chapter 248-17 WAC, Ambulance

Rules and Regulations) which require additional first-aid equipment.

Additional references: Chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-01517, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01517, filed 5/10/96, effective 1/1/97.]

### **WAC 296-305-02001 Personal protective equipment and protective clothing.**

Note: For wildland fire fighting personal protective equipment and clothing requirements see WAC 296-305-07003, Personal protective clothing and equipment for wildland fire fighting.

(1) Employers shall provide and maintain at no cost to the employee the appropriate protective ensemble/protective clothing to protect from the hazards to which the member is or is likely to be exposed. Employers shall ensure the use of all protective equipment and clothing required by this standard. Employers shall assure that the protective clothing and equipment ordered or purchased after the effective date of this standard meets the requirements of this standard. Full protective equipment designated for the task, shall be worn for all department activities.

(2) Fire fighters shall be trained in the function, donning and doffing, care, use, inspection, maintenance and limitations of the protective equipment assigned to them or available for their use.

(3) Protective clothing and protective equipment shall be used and maintained in accordance with manufacturer's instructions. A written maintenance, repair, retirement, servicing, and inspection program shall be established for protective clothing and equipment. Specific responsibilities shall be assigned for inspection and maintenance. This requirement applies to fire fighter's personally owned equipment as well as equipment issued by the employer.

(4) The fire department shall provide for the cleaning of protective clothing and contaminated station/work uniforms at no cost to the employee. Such cleaning shall be performed by either a cleaning service, or at a fire department facility, that is equipped to handle contaminated clothing.

Note: See Appendix A.

(5) Personal protective equipment and clothing shall be of a type specified by NIOSH, MSHA, NFPA, ANSI, or as specifically referenced in the appropriate section of this chapter.

(6) Station/work uniforms. Station/work uniforms are not themselves intended as primary protective garments.

(a) Station/work uniforms if provided, shall meet the requirements as specified in the 1990 or 1994 edition of NFPA 1975.

(b) All station/work uniforms purchased after the effective date of this regulation shall meet the requirements set forth in this standard.

(c) Station/work uniforms include trousers, and/or coveralls, but exclude shirts, underwear, and socks.

(d) Members shall not wear any clothing that is determined to be unsafe due to poor thermal stability or poor flame resistance when engaged in or exposed to the hazards of structural fire fighting. Because it is impossible to ensure that

every member will respond to an incident in a station/work uniform or will change out of fabrics that have poor thermal stability or ignite easily, before donning protective garments, the fire department shall inform members of the hazards of fabrics that melt, drip, burn, stick to the skin and cause burns to the wearer due to poor thermal stability or poor flame resistance.

(e) Garments meeting the requirements of WAC 296-305-07003(1), meet the intent of this section.

(f) Station/work uniforms purchased prior to the effective date of this chapter shall be acceptable for a period of two years or until the employers current inventory has been exhausted, whichever comes first.

(7) Turnout clothing/pants and coat:

Proximity clothing:

(a) All turnout clothing used as proximity clothing shall meet the requirements of NFPA, 1976 Standard on Protective Clothing for Proximity Fire Fighting, 1992 edition.

(b) There shall be at least a two-inch overlap of all layers of the protective coat and the protective trousers so there is no gaping of the total thermal protection when the protective garments are worn. The minimum overlap shall be determined by measuring the garments on the wearer, without SCBA, with the wearer in the most stretched position, hands together reaching overhead as high as possible.

(c) Single piece protective coveralls shall not be required to have an overlap of all layers as long as there is continuous full thermal protection.

(d) Fire departments that provide protective coats with protective resilient wristlets secured through a thumb opening may provide gloves of the gauntlet type for use with these protective coats. Fire departments that do not provide such wristlets attached to all protective coats shall provide gloves of the wristlet type for use with these protective coats.

(8) Structural fire fighting clothing.

(a) All turnout clothing purchased after the effective date of these regulations shall meet the requirements of the 1991 edition of NFPA, Standard on Protective Clothing for Structural Fire Fighting 1971 or the 1997 edition of NFPA, Standard on Protective Ensemble for Structural Fire Fighting 1971. In no case, shall fire fighters wear personal protective clothing manufactured prior to the 1986 edition, NFPA, Standard on Protective Clothing for Structural Fire Fighting 1971.

(b) Turnout clothing shall be maintained as specified by the manufacturer.

(c) Repairs to turnout clothing shall be done to the manufacturer's specification by qualified individuals approved by the manufacturer. Repairs must be made using materials and methods in accordance with the applicable standards under which the article was produced. Repairs include any and all alterations, modifications, additions, deletions or any other change made to the manufacturer's PPE article.

(d) Turnout clothing which is damaged or does not comply with this section shall not be used.

(e) All turnout clothing shall be inspected semi-annually by an individual qualified by the employer. Inspection intervals shall not exceed six months.

[Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-02001, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02001, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02003 Eye and face protection.** (1)

Face and eye protection shall be provided for and used by fire fighters engaged in fire suppression and other operations involving hazards to the eye and face at all times when the face is not protected by the full facepiece of the SCBA. Primary face and eye protection appropriate for a given specific hazard shall be provided for, and used by, members exposed to that specific hazard. Such primary face and eye protection shall meet the requirements of ANSI Z87.1, 1989 edition.

(2) Persons whose vision requires the use of corrective lenses in spectacles, and who are required by this standard to wear eye protection, shall wear goggles or spectacles of one of the following types:

(a) Spectacles with protective lenses that provide optical correction.

(b) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(c) Goggles that incorporate corrective lenses mounted behind the protective lens.

(3) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see such limitations and precautions are strictly observed.

(4) Care, use, and maintenance for any type of eye or face protection shall follow the manufacturers suggested recommendations.

(5) Goggles shall be inspected, cleaned and disinfected prior to being reissued to other employees.

**Note:** The helmet face shield alone does not always provide adequate eye protection against flying particles, splash, gases and vapors. For known eye hazards, such as, but not limited to, cutting with power saws, chopping, drilling and using extrication equipment, the face shield should be worn with additional eye protection.

(6) Helmet face shields shall meet the requirements of NFPA, Standard Helmets for Structural Fire Fighting 1972, 1992 edition.

(7) For fire fighters that do not have a helmet face shield for eye and face protection, flexible or cushioned fitting goggles shall be provided.

(8) Goggles shall consist of a wholly flexible frame, forming a lens holder or a rigid frame with integral lens or lenses, having a separate, cushioned fitting surface on the full periphery of the facial contact area.

(a) Materials used shall be chemical-resistant, nontoxic, nonirritating and slow burning.

(b) There shall be a positive means of support on the face, such as an adjustable headband of suitable material or other appropriate means of support to retain the frame comfortable and snugly in front of the eyes.

[Statutory Authority: RCW 49.17.040, 99-05-080, § 296-305-02003, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02003, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02005 Hearing protection.** Fire departments must address noise issues as required by chapter 296-817 WAC, Hearing loss prevention (noise).

**Note:** Although noise levels may exceed the 115 dBA ceiling limit for noise exposures during structural fire fighting activities, hearing protection that will survive these conditions and not interfere with other essential gear may not

always be available. Fire departments must consider daily noise exposures and exposures to noise outside direct fire fighting activities when selecting hearing protection and may use less protection during direct fire protection when adequate hearing protection is not technically feasible.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-305-02005, filed 5/19/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02005, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02007 Hand protection.** (1) Fire fighters' gloves shall when worn with turnout clothing, provide protection to the wrist area. In turnout clothing where wristlet protection is not provided fire fighters' gloves shall be closed at the top.

(2) Fire departments shall establish written policy and procedure for the care, use, cleaning, replacement and/or retirement criteria, and maintenance of gloves issued.

(3) Gloves purchased after the effective date of this chapter shall comply with this section.

(4) Fire fighters' gloves used during structural fire fighting operations including rescue of victims from fires, and emergency medical operations where sharp or rough surfaces are likely to be encountered such as victim extrications shall meet the requirements of the 1993 edition of NFPA, Standard on Gloves for Structural Fire Fighting 1973 or the 1997 edition of NFPA, Standard on Protective Ensemble for Structural Fire Fighting 1971.

(5) Fire fighters gloves are not designed to provide protection to all environments. For gloves desired to fill the needs of a specific requirement see that specific section of this chapter. It is the intent of this section to provide protection from intrusion throughout the glove body by certain common chemicals, and from bloodborne pathogens. Fire departments shall consult the manufacturer's recommendation.

**Note:** Fire fighters should have their hands sized for compliance with the sizing chart as specified in NFPA, Standard on Gloves for Structural Fire Fighting 1973, 1993 edition.

[Statutory Authority: RCW 49.17.040, 99-05-080, § 296-305-02007, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02007, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02009 Body protection.** (1) Body protection shall be coordinated with torso, hand, head, foot, respiratory, and face protection as outlined in WAC 296-305-02001 through 296-305-02019.

(2) Fire departments shall establish written procedures for the use of components of any or all portions of protective equipment.

(3) Fire departments that provide structural and wildfire suppression shall establish written procedures for the use of protective clothing on structural and wildfire suppression activities.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02009, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02011 Body armor.** Fire departments that use protective body armor shall comply with the following:

(1) The fire department shall develop and have in place written guidelines for the care, use and maintenance of the

protective body armor in conjunction with the manufacturer's recommendations.

(2) All protective body armor shall meet or exceed National Institute of Justice NIF 0101.03, Threat Level II requirements, April 1987 edition, which is incorporated by reference (or shall be demonstrated by the employer to be equally effective), for both wet and dry ballistic performance.

(3) Body armor shall be correctly fitted following the manufacturer's recommendations and shall not be used beyond the manufacturer's warranty.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02011, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02013 Foot protection for structural fire fighting.** (1) Protective footwear purchased after the effective date of this standard shall comply with the 1992 edition of NFPA, Standard on Protective Footwear for Structural Fire Fighting 1974 or the 1997 edition of NFPA, Standard on Protective Ensemble for Structural Fire Fighting 1971.

(2) Fire departments shall establish written policy and procedure, care, use, maintenance, and retirement criteria for footwear in conjunction with the manufacturer's recommendations.

Note: Fire departments should establish cleaning and drying instruction including applicable warning regarding detergents, soaps, cleaning additives and bleaches for protective footwear.

(3) Fire fighter footwear may be resoled but the footwear upon resoling shall meet the requirements specified in this section.

[Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-02013, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02013, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02015 Head protection.** (1) Fire fighters who engage in or are exposed to the hazards of structural fire fighting shall be provided with and use helmets that meet the requirements of NFPA 1972, Standard on Helmets for Structural Fire Fighting, 1987 edition.

(2) Helmets purchased thirty days after the adoption of this chapter shall meet the requirements of the 1992 edition of NFPA, Standard on Helmets for Structural Fire Fighting 1972 or the 1997 edition of NFPA, Standard on Protective Ensemble for Structural Fire Fighting 1971.

(3) Fire departments shall establish a written policy and procedure for the care, use, maintenance, and retirement criteria for helmets.

(4) Helmets shall be provided with face shields or goggles.

(5) Helmet accessories shall not interfere with the function of the helmet or its components parts and shall not degrade the helmets performance.

(6) Helmets shall be maintained in accordance with the manufacturer's recommendations. No modifications shall be made without prior written approval from the manufacturer.

(7) Fire fighters shall follow the manufacturer's recommendations regarding cleaning, painting, marking, storage, and frequency and details of inspection.

Note: Helmets should be stored at room temperature and out of direct sunlight.

(2007 Ed.)

[Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-02015, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02015, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02017 Personal alert safety system (PASS) protection.** (1) Each fire fighter working in a hazardous area requiring the use of SCBA shall wear and use a PASS device. PASS devices shall meet the requirements of NFPA, Standard on Personal Alert Safety Systems (PASS) for Fire Fighters 1982, 1993 edition. (See WAC 296-305-07001 through 296-305-07019 for wildland fire fighting application.)

(2) Each PASS device shall be tested routinely to ensure it is ready for use and immediately prior to each use, and shall be maintained in accordance with the manufacturers' instructions.

(3) Fire departments shall provide written procedures for the use of PASS devices.

(4) Compliance with this section shall occur no later than two years after the effective date of this chapter.

Note: Fire departments should provide one spare PASS device for each ten units in service. If a department has less than ten devices they should have one spare.

(5) Fire departments shall establish a written procedure for the care, use, maintenance, and repair of PASS devices in conjunction with manufacturer's recommendations.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02017, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-02019 Life safety ropes, harnesses, and hardware protection.** (1) All life safety ropes, harnesses, and hardware used by fire departments shall meet the applicable requirements of NFPA 1983, Standard on Fire Service Life Safety Rope, Harness, and Hardware, 1990 edition.

(2) Ropes used to support the weight of members or other persons during rescue, fire fighting, other emergency operations, or during training evolutions shall be life safety rope.

(3) Life safety rope used for rescue at fires, or other emergency incidents, or for training, shall be permitted to be reused if inspected before, and after, each such use in accordance with the manufacturer's instructions and provided:

(a) The rope has not been visually damaged by the exposure to heat, direct flame impingement, chemical exposure, or abrasion.

(b) The rope has not been subjected to any impact load.

(c) The rope has not been exposed to chemical liquids, solids, gases, mists, or vapors of any materials, known to deteriorate rope.

(d) If the rope used for rescue at fires or other emergency incidents, or for training, has been subjected to (a), (b), or (c) of this section, or fails the visual inspection, it shall be destroyed after such use.

(e) If there is any question regarding the serviceability of the rope after consideration of the above, the safe course of action shall be taken and the rope shall be placed out of service. See Appendix B.

(f) Rope inspection shall be conducted by qualified inspectors in accordance with rope inspection procedures

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established and recommended as adequate by the rope manufacturer to assure rope is suitable for reuse.

(4) Fire departments shall establish written procedures for the use of life safety ropes and rescue operations utilizing harnesses and ropes.

(5) Records shall provide a history of each life safety and training rope. The minimum information to be reflected in the record of history of life safety and training ropes shall include: Date of manufacturer, organization serial number, use list to include inspectors name and space for comments.

(6) Rope used for training evolutions shall be designated as training rope and shall be permitted to be reused if inspected before and after each use in accordance with the manufacturer's instructions.

(7) The destruction of a rope means that it shall be removed from service and altered in such a manner that it could not be mistakenly used as a life safety rope. This includes disposal or removal of labels and cutting into short lengths to be used for utility purposes.

(8) All repairs to life safety harnesses shall be done by an authorized manufacturer's representative, or the manufacturer.

Note: See WAC 296-305-06003 (3), (4), (5), and (6) for the testing of life belts, ropes, and harnesses.

(9) Class I safety harnesses shall be used for fire fighter attachment to ladders and aerial devices.

(10) Class II and Class III life safety harnesses shall be utilized for fall arrest and rappelling operations.

(11) Rescue ropes shall be padded when deployed over edges or rough surfaces.

Note: See WAC 296-305-05005 for rope rescue applications.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02019, filed 5/10/96, effective 1/1/97.]

#### **WAC 296-305-02501 Emergency medical protection.**

(1) Fire fighters who perform emergency medical care or otherwise may be exposed to blood or other body fluids shall be provided with emergency medical face protection devices, and emergency medical garments that meet the applicable requirements of NAPA, Standard on Protective Clothing for Emergency Medical Operations 1999, 1992 edition.

Note: Prior to purchase, fire departments should request the technical data package required in NAPA 1999, 1992 edition, in order to compare glove and garment performance data. Departments reviewing these packages should ensure a relative ranking of the performance data before they purchase in order to provide the best performance of the EMS personal protective clothing.

(2) Fire fighters shall don emergency medical gloves prior to initiating any emergency patient care.

(3) Fire fighters shall don emergency medical garments and emergency medical face protection devices prior to any patient care during which splashes of body fluids can occur such as situations involving spurting blood or childbirth.

Note: Fire fighter turnout gear and gloves with vapor barriers may be used in lieu of emergency medical gloves and garments.

(4) Contaminated emergency medical garments, emergency medical face protection, gloves, devices, and emergency medical gloves shall be cleaned and disinfected, or dis-

posed of, in accordance with chapter 296-823 WAC, Occupational exposure to bloodborne pathogens.

(5) Fire departments shall establish a designated infection (exposure) control officer who shall ensure that an adequate infection control plan is developed and all personnel are trained and supervised on the plan.

(6) The infection control officer shall be responsible for establishing personnel exposure protocols so that a process for dealing with exposures is in writing and available to all personnel.

(7) The infection control officer or his/her designee will function as a liaison between area hospitals and fire department members to provide notification that a communicable disease exposure is suspected or has been determined by hospital medical personnel. The department infection control officer will institute the established exposure protocols immediately after report of an exposure. The infection control officer shall follow the confidentiality requirements of chapter 246-100 WAC and the medical protocol requirements of chapter 296-802 WAC.

(8) Fire departments shall have a written infection (exposure) control plan which clearly explains the intent, benefits, and purpose of the plan. The written document must cover the standards of exposure control such as establishing the infection control officer and all members affected; education and training; HB. vaccination requirements; documentation and record keeping; cleaning/disinfection of personnel and equipment; and exposure protocols.

(9) Policy statements and standard operating procedure guidelines shall provide general guidance and specific regulation of daily activities. Procedures shall include delegation of specific roles and responsibilities, such as regulation of infection control, as well as procedural guidelines for all required tasks and functions.

(10) Fire departments shall establish a records system for members health and training.

(11) Fire fighters shall be trained in the proper use of P.E., exposure protection, post exposure protocols, disease modes of transmission as it related to infectious diseases.

(12) Infectious disease programs shall have a process for monitoring fire fighters compliance with established guidelines and a means for correcting noncompliance.

(13) Fire department members shall be required to annually review the infectious disease plan, updates, protocols, and equipment used in the program.

(14) Fire departments shall comply with chapter 296-823 WAC, Occupational exposure to bloodborne pathogens, in its entirety.

(15) Tuberculosis (TB) exposure and respiratory protection requirements.

(a) Fire fighters shall wear a particulate respirator (PR) when entering areas occupied by individuals with suspected or confirmed TB, when performing high risk procedures on such individuals or when transporting individuals with suspected or confirmed TB in a closed vehicle.

(b) A NIOSH-approved, 95% efficient particulate air respirator is the minimum acceptable level of respiratory protection.

(i) Fit tests are required.

(ii) Fit tests shall be done in accordance with chapter 296-842 WAC.

Note 1: Emergency-response personnel should be routinely screened for tuberculosis at regular intervals. The tuberculin skin test is the only method currently available that demonstrates infection with *Mycobacterium tuberculosis* (*M. tuberculosis*) in the absence of active tuberculosis.

Note 2: If possible, the rear windows of a vehicle transporting patients with confirmed, suspected, or active tuberculosis should be kept open, and the heater or air conditioner set on a noncirculating cycle.

#### Additional References:

Chapter 296-823 WAC, Occupational exposure to bloodborne pathogens.

WAC 296-62-08001(3), Exposure Control.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-305-02501, filed 1/18/05, effective 3/1/05; 04-10-026, § 296-305-02501, filed 4/27/04, effective 8/1/04; 03-09-110, § 296-305-02501, filed 4/22/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 99-10-071, § 296-305-02501, filed 5/4/99, effective 9/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02501, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-03001 Hazardous materials protection.** (1) Structural fire fighting protective clothing shall not be used as primary protection for hazardous material incidents except as noted in the current edition of the Department of Transportation Emergency Response guidebook, which is incorporated by reference or shall be demonstrated by the employer to be equally effective.

(2) Fire departments shall use the technical data package provided by the clothing manufacturer when selecting the hazardous chemical protection.

(a) The approach to selecting personal protective clothing must encompass an ensemble of clothing items that are integrated to provide a level of protection and the ability to carry out emergency response activities.

(b) The following is a check list of components that may form the chemical protective ensemble:

(i) Protective clothing (suits, coveralls, hoods, gloves, boots)

(ii) Respiratory equipment (SCBA)

(iii) Cooling system (ice vest, air circulation, water circulation)

(iv) Head protection

(v) Inner garments

(vi) Outer protection (overgloves, overboots, flashcovers)

(3) Hazardous chemical protective equipment shall be classified by performance and for the purpose of this chapter are defined as:

(a) Vapor-Protective Suits (Level "A")

(b) Liquid Splash-Protective Suits (Level "B")

(c) Support Function Protective Suits

(4) Fire department personnel involved in hazardous materials incident shall be protected against potential chemical hazards. Chemical protective clothing shall be selected and used to protect the respiratory system, skin, eyes, face, hands, feet, head, and body.

(5) Vapor protective and liquid splash-protective suits shall completely cover both the wearer and the wearer's breathing apparatus. Wearing a SCBA or other respiratory equipment outside the suit subjects this equipment to the chemically contaminated environment, increasing possible failure potentials and decontamination problems.

(6) Fire fighters who engage in operations likely to result in significant exposure to vapors that can reasonably be presumed harmful by way of dermal exposure shall have available and make appropriate use of vapor protective suits. Vapor protective suits shall meet the requirements of NFPA, Standard on Vapor Suits for Hazardous Chemical Emergencies in 1991, 1990 edition, with the single exception that suits meeting all but the flammability standard may only be worn in atmospheres verified by means of appropriate air monitoring to be at no more than 10% of the lower explosive limit (LEL).

(7) Prior to the use of vapor protective suits, liquid splash-protective suits or support function protective suits, the department shall consult the technical data package to assure that the garment is appropriate for the specific hazardous chemical emergency.

(8) Vapor protective suits and liquid splash-protective suits shall not be used alone for any fire fighting applications or for protection from radiological, biological, or cryogenic agents or in flammable or explosive atmospheres.

(9) Fire fighters who engage in operations or who are exposed to known chemicals in liquid-splash chemical environments during hazardous chemical material emergencies shall be provided with, and shall use, liquid splash-protective suits. Liquid splash-protective suits shall meet the requirements of NFPA, Standard on Liquid-Splash Protective Suits for Hazardous Chemical Emergencies 1992, 1991 edition.

(10) Liquid splash-protective suits shall not be used when operations are likely to result in significant exposure to chemicals or specific chemical mixtures with known or suspected carcinogenicity as indicated by any one of the following documents if it can reasonably be expected that fire fighters in vapor protective suits would be significantly better protected:

(a) N. Irving Sax, *Dangerous Properties of Industrial Chemicals*, current edition.

(b) NIOSH Pocket Guide to Chemical Hazards, current edition.

(c) U.S. Coast Guard Chemical Hazard Response Information System (CHRIS), Volumes 13, *Hazardous Chemical Data*.

(11) Liquid splash-protective suits shall not be used when operations are likely to result in significant exposure to chemicals or specific chemical mixtures with skin toxicity notations as indicated by the American Conference of Government Industrial Hygienists (ACGIH), *Threshold Limit Values and Biological Exposure Indices for 1988-1989* if it can reasonably be expected that fire fighters in vapor protective suits would be significantly better protected.

(12) Support garments shall not be used in the hot zone of any hazardous material operation.

(13) Fire fighters assigned to functional support operations outside the hot zone during hazardous chemical emergencies shall be provided with and shall use support function protective garments. Support function garments shall meet the requirements of NFPA, *Standard on Support Function Protective Garments for Hazardous Chemical Operations* 1993, 1990 edition.

(14) Support function protective garments shall not be used for protection from chemical or specific chemical mix-

ture with known or suspected carcinogenicity as indicated by (10)(a), (b), or (c).

(15) Support function protective garments shall not be used for protection from chemicals or specific chemical mixtures with skin toxicity notations as indicated in the American Conference of Governmental Industrial Hygienists, Threshold Values and Biological Exposure Indices for 1988-1989.

Note: Decontamination - See Appendix C.

Additional References: WAC 296-305-05011, Hazardous materials operations.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-03001, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-04001 Respiratory equipment protection.** (1) Fire fighter's self-contained breathing apparatus (SCBA) shall:

- (a) Be pressure demand type (positive pressure);
- (b) Operate in the positive pressure mode only;
- (c) Have a minimum of thirty minutes service duration;
- (d) Be NIOSH certified; and
- (e) Meet the requirements of the 1992 or 1997 edition of NFPA, Standard on Open Circuit Self Contained Breathing Apparatus for Fire Fighters 1981.

(2) Closed circuit SCBA shall:

- (a) Be positive pressure;
- (b) Be NIOSH certified; and
- (c) Have a minimum thirty-minute service duration.

(3) Members using SCBA's shall operate in teams of two or more.

(4) Except as otherwise provided in this chapter, fire departments shall adopt, maintain and implement a written respiratory protection program that addresses the requirements of chapter 296-842 WAC, Respirators and Part I-1, Asbestos, Tremolite, Anthophyllite, and Actinolite. This includes program administration, medical limitations, equipment limitations, equipment selection, inspection, use, maintenance, training, fit testing procedures, air quality, and program evaluation.

Note: Additional information on respirators and respirator usage can be found in ANSI Z88.2 - American National Standard for Respiratory Protection; ANSI Z88.5 - Practices for Respiratory Protection for Fire Service; various NFPA publications (1981, 1404, 1500, etc.), and the Washington State Fire Service Training Program for respiratory training and usage.

(5) When fire departments purchase compressed breathing air from a vendor, the fire department shall require the vendor to provide certification and documentation of breathing air quality as specified in subsection (21) of this section and in chapter 296-842 WAC.

(6) When the fire department makes its own breathing air or uses vendor purchased breathing air, the air quality from compressors, cascade systems cylinders, shall be tested at least quarterly as specified in subsection (21) of this section.

(7) Fit testing shall be conducted in accordance with this section and chapter 296-842 WAC, Respirators.

(a) Each new member shall be tested before being permitted to use SCBA's in a hazardous atmosphere.

(b) Only fire fighters with a properly fitting facepiece shall be permitted by the fire department to function in a hazardous atmosphere with SCBA. (Reference WAC 296-842-18005.)

(c) Fit testing shall be repeated:

(i) At least once every twelve months.

(ii) Whenever there are changes in the type of SCBA or facepiece used.

(iii) Whenever there are significant physical changes in the user. Example: Weight change of ten percent or more, scarring of face seal area, dental changes, cosmetic surgery, or any other condition that may affect the fit of the facepiece seal.

(d) The fit testing is done only in a negative-pressure mode. If the facepiece is modified for fit testing, the modification shall not affect the normal fit of the device. Such modified devices shall only be used for fit testing.

(e) The fit test procedures and test exercises described in WAC 296-62-07162, Asbestos, Appendix C, shall be followed unless stated otherwise in this chapter.

(f) Respirator fit test records shall include:

(i) Written guidelines for the respirator fit testing program including pass/fail criteria;

(ii) Type of respirator tested including manufacturer, model, and size;

(iii) Type of fit test and instrumentation or equipment used;

(iv) Name or identification of test operator;

(v) Name of person tested;

(vi) Date of test; and

(vii) Results of test.

Note: Fire fighters should be issued individual facepieces.

(8) Facial hair, contact lenses, and eye and face protective devices.

(a) A negative pressure respirator, any self-contained breathing apparatus, or any respirator which is used in an atmosphere immediately dangerous to life or health (IDLH) equipped with a facepiece shall not be worn if facial hair comes between the sealing periphery of the facepiece and the face or if facial hair interferes with the valve function.

(b) The wearer of a respirator shall not be allowed to wear contact lenses if the risk of eye damage is increased by their use.

(c) If a spectacle, goggle, or face shield must be worn with a facepiece, it shall be worn so as to not adversely affect the seal of the facepiece to the face. See WAC 296-62-07170(2).

(d) Straps or temple bars shall not pass between the seal or surface of the respirator and the user's face.

(9) At the end of suppression activities (to include fire overhaul) and before returning to quarters:

(a) Fire fighters shall be decontaminated prior to removal of respirators whenever fire fighting activities resulted in exposure to a hazardous substance.

(b) When exchanging air supply bottles during suppression or overhaul activities, reasonable precautions shall be taken to maintain uncontaminated atmosphere to the breathing zone and facepiece supply hose.

(10) Self-contained respiratory equipment shall be available and used by all fire fighters who enter into hazardous atmospheres during structural fire fighting activities.

(11) Positive pressure air line respirators may be used only for atmospheres other than IDLH and must be equipped with a five minute minimum capacity positive pressure escape bottle.

(a) If the service life of the auxiliary air supply is fifteen minutes or less it shall not be used for entry into an IDLH atmosphere but it may be used for escape purposes. The auxiliary air supply may be used for entry into an IDLH atmosphere only when the service life of the unit exceeds fifteen minutes and when not more than twenty percent of the noted air supply will be used during entry.

(b) The maximum length of hose for supplied air respirators is 300 feet (91 meters). Such hose shall be heavy duty nonkinking and NIOSH approved.

(12) Respirators shall be provided for, and shall be used by, all personnel working in areas where:

- (a) The atmosphere is hazardous;
- (b) The atmosphere is suspected of being hazardous; or
- (c) The atmosphere may rapidly become hazardous;

(13) Anytime fire fighters are working inside a confined space, such persons shall be provided with SCBA or air line respirator with escape bottle, and shall use the equipment unless the safety of the atmosphere can be established by testing and continuous monitoring.

(14) Fire fighters using a properly functioning SCBA shall not compromise the protective integrity of the SCBA by removing the facepiece for any reason in hazardous atmospheres or in atmospheres where the quality of air is unknown.

(15) Fire fighters shall receive training for each type and manufacturer of respiratory equipment available for their use, the step-by-step procedure for donning the respirator and checking it for proper function. Required training shall include:

- (a) Recognizing hazards that may be encountered;
- (b) Understanding the components of the respirator;
- (c) Understanding the safety features and limitations of the respirator; and
- (d) Donning and doffing the respirator.

(16) After completing such training, each fire fighter shall practice at least quarterly, for each type and manufacturer of respirator available for use, the step-by-step procedure for donning the respirator and checking it for proper function.

(17) Members shall be tested at least annually on the knowledge of respiratory protection equipment operation, safety, organizational policies and procedures, and facepiece seals, to the fire department's standard. Such records shall remain part of the member training file.

(18) Members shall be allowed to use only the make, model, and size respirator for which they have passed a fit test within the last twelve months.

(19) In cases where there is a reported failure of a respirator, it shall be removed from service, tagged and recorded as such, and tested before being returned to service.

(20) Fire fighters shall be thoroughly trained in accordance with the manufacturer's instructions on emergency procedures such as use of regulator bypass valve, corrective

action for facepiece and breathing tube damage, and breathing directly from the regulator (where applicable).

(21) Compressed gaseous breathing air in the SCBA cylinder shall meet the requirements of ANSI/CGA G7.1 - Commodity Specification for Air, with a minimum air quality of grade D, as well as meeting a water vapor level of 24 ppm or less.

(22) SCBA cylinders shall be hydrostatically tested within the periods specified by the manufacturer and the applicable governmental agencies.

Additional reference: Chapter 296-842 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-055, § 296-305-04001, filed 10/3/05, effective 12/1/05; 05-03-093, § 296-305-04001, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050. 02-12-098, § 296-305-04001, filed 6/5/02, effective 8/1/02. Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-04001, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04001, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-04501 Automotive fire apparatus design and construction.** (1) All new fire apparatus with the exception of specialized equipment, shall conform to the following minimum safety standards contained in NFPA Booklets No. 1901, 1902, 1903, 1904, and other 1900's.

(2) Fire apparatus, purchased after December 17, 1977, weighing 10,000 pounds or more shall conform with the following U.S. Department of Transportation standards, when applicable:

- (a) 49 CFR Ch. V (10-93 edition) 571.121 "Air brake systems";
- (b) 49 CFR Ch. V (10-93 edition) 571.106 "Hydraulic brake hoses";
- (c) 49 CFR Ch. V (10-93 edition) 571-211 "Hydraulic brake hoses."

(3) Employers acquiring used apparatus or used equipment shall not be required to bring it under a more stringent code than the one in force at the time the apparatus was manufactured. However, such vehicle must meet applicable U.S. Department of Transportation standards and chapter 296-865 WAC, Motor vehicles.

(4) Fire apparatus tailboards and steps shall have a non-skid rough surface.

(5) Exhaust systems shall be installed and maintained in proper condition, and shall be so designed as to minimize the exposure of the fire fighter to the exhaust gases and fumes.

(6) Spinner knobs shall not be attached to the steering handwheel of fire apparatus.

(7) The transmission shifting pattern of the apparatus shall be clearly stenciled or labeled and posted so it can be clearly read by the driver while operating the apparatus.

(8) The height of any apparatus, over seven feet in height from the ground to the top of the beacon or highest point of the apparatus, shall be clearly labeled in a place where it can be easily and clearly read by the driver while operating the apparatus.

(9) All apparatus in excess of 10,000 pounds loaded weight, shall have the weight of the vehicle in pounds and tons clearly labeled in a place where it can be easily and clearly read by the driver while operating the apparatus.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-305-04501, filed 8/10/05, effective 10/1/05. Statutory Author-

ity: RCW 49.17.040, 99-05-080, § 296-305-04501, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04501, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-04503 Automotive fire apparatus equipment.** (1) Vehicles used to transport fire fighters and employer representatives shall have compartments for carrying sharp tools, saws, chisels, axes, etc., or if carried on the outside of the apparatus, equipment with sharp points and edges shall be covered to prevent injury to fire fighters and employer representatives.

(2) Personnel restraints for traveling.

(a) All persons riding on fire apparatus shall be seated and secured to the vehicle by seatbelts or safety harnesses at any time the vehicle is in motion.

(b) Seatbelts shall comply with U.S. Department of Transportation Part 49 CFR Section 571, Standards 209 and 210.

(c) Riding on tailsteps or in any other exposed position such as sidesteps or running boards shall be specifically prohibited.

(d) Standing while riding shall be specifically prohibited.

(e) Members actively performing necessary emergency medical care while the vehicle is in motion shall be restrained to the extent consistent with the effective provision of such emergency medical care. All other persons in the vehicle shall be seated and belted in approved seating positions while the vehicle is in motion.

(f) Fire departments permitting hose loading operations while the vehicle is in motion shall develop a written policy and guidelines addressing all safety aspects.

Note: Policy and operating guidelines should address:

- The assigning of a member as a safety observer who should have an unobstructed view of the hose loading operation and be in visual and voice contact with the driver.
- Allowed maximum fire apparatus speed when hose loading;
- Control of nonfire department vehicular traffic; and
- Allowing members in the hose bed, but limit standing to only when the vehicle is not moving.

Note: See WAC 296-305-07011(3) for exceptions for wildland vehicles.

(3) Each fire apparatus shall carry a current U.S. Department of Transportation chemical identification book or the equivalent.

(4) Ladders stowed on the sides of apparatus, which protrude past the tailboard, shall have guards over the protruding ends.

(5) No employer shall permit automotive fire apparatus equipment which has an obstructed view to the rear, to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level.

[Statutory Authority: RCW 49.17.040, 99-05-080, § 296-305-04503, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04503, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-04505 Automotive apparatus operational rules.** (1) Each employer of staffed fire apparatus shall establish a written policy and procedure whereby the appa-

tus has a scheduled daily operational check. Each employer of unstaffed fire apparatus shall establish a schedule appropriate to that department's activities.

(2) Any item found to be in need of repair shall be reported immediately to the officer in charge or other appropriate person.

(3) Fire fighting apparatus shall be brought to a full stop before employees are allowed to step from the apparatus.

(4) Fire fighters shall not be in the apparatus hose bed while hose is being run out from the bed.

(5) Headlights shall be on at all times when any fire or emergency vehicle is responding to a call.

(6) All apparatus over 20,000 pounds (gross vehicle weight) shall utilize wheel blocks when parked at an emergency scene.

(7) Apparatus responding to alarms shall meet specifications in RCW 46.61.035, relating to operations of authorized emergency vehicles.

(8) All operators of emergency vehicles shall be trained in the operations of apparatus before they are designated as drivers of such apparatus. The training program shall be established by each fire department. Once trained, all operators shall familiarize themselves with any apparatus prior to operating such apparatus even for brief periods of time.

Additional Reference: Washington State Fire Protection Bureau - Emergency Vehicle Accident Prevention (EVAP) program.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04505, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-04507 Fire apparatus maintenance and repair.** (1) If at any time a fire apparatus is found to be in an unsafe condition, it shall be reported immediately to the officer on duty.

(2) If in the officer's determination, the apparatus cannot be used in a safe manner, it shall be taken out of service until it has been restored to a safe operating condition.

(3) All repairs and preventive maintenance to fire apparatus shall only be made by personnel deemed qualified by the registered owners of the fire apparatus.

(a) A preventive maintenance program shall be instituted and records maintained for each individual apparatus in order to record and track potential or on-going problems.

(b) A minimum annual service test of apparatus shall be made according to NFPA guidelines relating to pumper apparatus.

(c) Failure of any portion of the annual service test shall constitute the apparatus to be placed out of service as a pumper until adequate repairs are made and the apparatus successfully completes said tests.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04507, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-04509 Aerial ladders.** (1) When operating aerial ladders, the manufacturer's suggested procedures shall be followed.

(2) Aerial ladders shall be used according to the following requirements:

(a) The number of fire fighters permitted on aerial ladders shall be in accordance with the manufacturer's instructions.

(b) Aerial ladders shall not knowingly be positioned under dangerous cornices or other loose overhanging objects that may endanger fire fighters and fire fighters working on, or climbing the ladders, except where rescue operations are essential.

(c) When working on, or near energized electrical lines, the following minimum working clearances shall be observed:

(i) For lines rated 50 kv or below, the minimum clearance between the lines and any part of the equipment shall be ten feet.

(ii) For lines rated over 50 kv, the minimum clearance shall be ten feet plus 0.4 inch for each 1 kv.

(iii) For low voltage lines (operating at 750 volts or less), the work shall be performed in a manner to prevent the fire fighters contacting the energized conductor.

(d) Fire apparatus aerial ladders shall be positioned for the greatest stability feasible at the fire scene.

(e) The tip of the aerial ladder shall not be forcefully extended against a solid structure.

(f) Aerial ladders shall not be extended or retracted while fire fighters are climbing the ladder.

(g) Locking in shall not be permitted. If it is necessary for fire fighters to be positioned on the aerial, they shall be secured by a life belt.

(h) Ladder pipes, when in use, shall be secured to the aerial in such a manner so that the ladder pipe cannot accidentally be dislodged while in operation.

(i) The operator of an aerial ladder shall remain on the turntable whenever fire fighters are working on the aerial. If the ladder is used only as a ground ladder, no operator is needed on the turntable.

(3) The following shall regulate the design and use of the operating turntable and ladder:

(a) Ladders shall be designed to have nonskid protection on the rungs.

(b) Turntable controls and valves for rotating, extending, or elevating the aerial ladder shall be clearly and distinctly marked as to function.

(c) Aerial controls shall be spring loaded and have a safety catch so that the controls shall return to the neutral position if the operator is incapacitated.

(d) The operator of the aerial shall be provided with a nonskid surface on the turntable surface.

(e) A railing of approximately 44 inches in height, and if possible, not less than 36 inches in length, shall be installed on the turntable in back of the operators position.

(f) A light of not less than 10,000 candlepower shall be provided at the base to illuminate the ladder at night in any position of operation.

(4) The following shall regulate the communication systems on the aerial ladder and on the automotive fire apparatus.

(a) A two-way voice communication system shall be installed between the top fly of the ladder and the lower control station.

(b) There shall be some type of electrical signal or voice communication located in the tractor of tillered aerial for communication signals between the tillerman and driver. The apparatus shall not be moved unless the proper signal, as shown in Appendix E, is received from the tillerman.

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(5) When maintaining the aerial ladder, the manufacturer's instructions shall be followed.

(a) Cables, pulleys, rails and rungs of aerial ladders shall be inspected for wear and tightness on a monthly basis or every ten hours of operating time, whichever comes first.

(b) Pulleys on the aerial with cracks or pieces broken out of rims shall be replaced.

(c) Cables showing evidence of damage or wear shall be replaced.

(d) Rungs or rails that have been subjected to unusual impact shall be tested before usage.

(6) The automotive fire apparatus used in conjunction with aerial ladders shall be designed and used according to the following:

(a) Ground jacks or outriggers shall be deployed before an aerial ladder is put into operation.

(b) Ground plates shall be deployed under the outriggers or jacks at all times.

(c) Hand, airbrakes, and spring brakes for fifth wheel shall be set whenever an aerial ladder is in operation.

(d) In addition to ground jack supports and outriggers, wheel blocks shall be used whenever the aerial is in operation.

(e) Wheel chocks shall be rated by the manufacturer of the chock for the apparatus it is to be used on.

(f) Sand shall be put under jacks and outriggers when operating on ice or snow.

(7) Annual testing of metal aerial ladders shall follow the recommendations of the current National Fire Protection Association Standard.

(a) The aerial ladder, as well as the support section of the apparatus which supports the turntable, shall be nondestructively tested by a certified testing agency every five years.

(b) After any accident that causes structural damage, the test in (a) shall be performed and all defects detected shall be corrected before the apparatus is returned to service.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04509, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-04511 Elevated platforms.** (1) Elevated platform system design requirements:

(a) The platform shall have a minimum floor area of fourteen square feet.

(b) The platform shall be provided with a guard railing. The guard railing shall be 42 to 45 inches high on all sides.

(c) The railing shall be constructed so that there is no opening below it greater than 19 inches.

(d) There shall be two gates below the top railing, each of which shall be provided with suitable safety latches.

(e) A kick plate not less than four inches high shall be provided around the floor of the platform.

(f) Drain openings shall be provided to prevent water accumulation on the platform.

(g) A heat-protective shield shall be provided on the platform for the protection of the operator.

(h) Hydraulic or pneumatic systems shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(i) The basic structural elements of the hydraulic or articulating boom shall have a safety factor of three.

(j) Each hydraulic or pneumatic system for the boom shall be equipped with a pilot operated check valve or other appropriate device to prevent free fall in the event of hydraulic failure.

(2) Requirements related to the controlling of elevated platforms:

(a) A control or device shall be provided at both the lower control station and the platform control station to allow either operator to completely deactivate the platform controls.

(b) During the deactivation of the platform controls, the lower controls shall remain operable.

(c) A plate shall be located at the platform control unit or units listing the following information:

(i) Model and serial number of the manufacturer;

(ii) Rated capacity of the platform;

(iii) Operating pressure of the hydraulic or pneumatic systems or both;

(iv) Caution or restriction of operation or both; and

(v) Control instructions.

(vi) This plate shall be clearly visible to the operator at the lower control position.

(d) There shall be an operator at the lower controls at all times while the fire fighter is in the bucket.

(e) The operator at the lower controls shall make certain the fire fighter on the platform is secured by his life belt, or equivalent, before raising the platform.

(3) Testing of elevated platforms and related apparatus shall be conducted annually.

(a) Testing of elevated platforms and related apparatus shall be in accordance with NFPA, Standard for Testing Fire Department Aerial Ladders 1914, 1991 edition.

(b) It is recommended that the boom section as well as the support section of the apparatus which supports the turntable should be nondestructively tested by a certified testing agency every five years.

(c) After any accident that causes structural damage, testing shall be performed and all defects detected shall be corrected before the apparatus is returned to service.

(d) Elevated platform testing shall follow recommendations of the current National Fire Code.

(e) Fire apparatus elevated platforms shall be positioned for the greatest stability feasible at the fire scene.

(4) A two-way voice communication system shall be installed between the platform and the lower control station.

(5) Automotive apparatus used in conjunction with elevated platforms shall be used in accordance with the following:

(a) Hand or air brakes shall be set before the platform is operated.

(b) Jacks or outriggers shall be used if the platform is to be elevated.

(c) Wheel blocks shall also be used when the platform is in operation unless the type of apparatus is one that has wheels that lift off the ground when the jacks or outriggers are engaged.

(d) Ground plates shall be used under the outriggers or jacks.

(e) Sand shall be put under jacks and outriggers when operating on ice or snow.

(f) When working on or near energized electrical lines, the fire department shall develop operational procedures for observing the following minimum working clearances:

(i) For lines rated 50 kv or below, the minimum clearance shall be ten feet.

(ii) For lines rated over 50 kv, the minimum clearance shall be ten feet plus 0.4 inch for each 1 kv.

(iii) For low voltage lines (operating at 750 volts or less), the work shall be performed in a manner to prevent the fire fighters contacting the energized conductor.

(6) Appliances mounted on elevated platforms. Platform mounted monitors shall be operated in accordance with the manufacturer's instructions.

Additional References: WAC 296-24-880.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-04511, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04511, filed 5/10/96, effective 1/1/97.]

### **WAC 296-305-05001 Emergency fireground operations—Structural.**

(1) The fire department shall establish an incident command system (ICS) with written guidelines applying to all members involved in emergency operations. All members involved in emergency operations shall be familiar with the ICS system. Personnel shall be trained and qualified by their department in the incident command system prior to taking a supervisory role at an emergency scene.

(2) At an emergency incident, the incident commander shall be responsible for the overall safety of all members and all activities occurring at the scene.

(3) All emergency incidents shall be managed by an ICS; the incident commander shall establish an organization with sufficient supervisory personnel to control the position and function of all members operating at the scene and to ensure that safety requirements are satisfied.

(4) At an emergency incident, the incident commander shall have the responsibility to:

(a) Assume and confirm command and take an effective command position.

(b) Perform situation evaluation that includes risk assessment.

(c) Initiate, maintain, and control incident communication.

(d) Develop an overall strategy and attack plan and assign units to operations.

(e) Develop an effective incident organization by managing resources, maintaining an effective span of control, and maintaining direct supervision over the entire incident by creating geographical and/or functional areas as appropriate for the scope and size of the incident.

(f) Review, evaluate, and revise the operational plan as required.

(g) Continue, transfer, and terminate command.

(5) The fire department shall develop a risk management policy that can be implemented into the function of incident command and the development of incident strategies.

The risk management policy should include direction and guidance to the incident commander in formulating incident planning relating to the level of risk that may be undertaken in any given incident to save lives and to save property in as safe a manner as dictated by the situation.

(6) The fire department shall establish written procedures and guidelines for tracking all members operating at an emergency incident.

(7) The incident command system shall provide for control of access to hazardous areas of the incident scene by department members.

(8) Fire fighters operating in hazardous areas at emergency structural fire incidents shall operate in teams of two or more.

Team members operating in hazardous areas shall be in communication with each other through visual, audible, physical, safety guide rope, or electronic means, or by other means in order to coordinate their activities. Team members shall be in close proximity to each other to provide assistance in case of emergency.

(9) The fire department shall provide personnel for the rescue of members operating at emergency incidents as the need arises.

(10) Before beginning interior structural fire fighting operations, the incident commander must evaluate the situation and risks to operating teams.

(a) Except as provided in WAC 296-305-05001(11), fire fighters must not engage in interior structural fire fighting in the absence of at least two standby fire fighters.

(b) All standby fire fighters must be fully equipped with the appropriate protective clothing, protective equipment and SCBA.

(c) Standby members must remain aware of the status of fire fighters in the hazardous area.

(d) Standby members must remain in positive communication with the entry team(s), in full protective clothing the SCBA donned in the standby mode.

(e) Standby members may be permitted to perform other duties outside the hazardous area, provided constant communication is maintained between a standby member and the entry team(s), and provided that those duties will not interfere with the standby members' ability to participate in a rescue as appropriate.

(f) Early consideration should be given to providing one or more rapid intervention teams commensurate with the needs of the situation.

(11) In the "initial stage" of a structure fire-incident where only one team is operating in the hazardous area, where additional resources can reasonably be expected, and where exceptional circumstances indicate that immediate action may be necessary to prevent or mitigate the loss of life or serious injury to citizenry or fire fighters, at least one additional fire fighter must be assigned to stand by outside the hazardous area where the team is operating.

(a) The standby fire fighter must remain aware of the status of fire fighters in the hazardous area.

(b) The standby fire fighter must remain in positive communication with the entry team, in full protective clothing with SCBA donned in the standby mode.

(c) The standby fire fighter may be permitted to perform other duties outside the hazardous area, provided constant communications is maintained with the team in the hazardous area, and provided that those duties will not interfere with his or her ability to initiate a rescue as appropriate.

(d) Once additional resources have arrived on the scene, the incident must no longer be considered in its initial stage

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and all the requirements of WAC 296-305-05001(10) must be met.

Note: Nothing in this section shall prevent activities which may reasonably be taken by members first on the scene to determine the nature and extent of fire involvement.

(12) The fire department shall develop and maintain written guidelines for the safety of members at incidents that involve violence, unrest, or civil disturbance. Such situations may include but not be limited to riots, fights, violent crimes, drug related situations, family disturbances, deranged individuals, and people interfering with fire department operations.

(13) Officers at emergency scenes shall maintain an awareness of the physical condition of members operating within their span of control and ensure that adequate steps are taken to provide for their safety and health. The command structure shall be utilized to request relief and reassignment of fatigued crews.

(14) Wildfire suppression personal protective clothing/equipment shall not be utilized for interior attacks on structures.

(15) Teams in the hazardous area shall have positive communication capabilities with the incident command structure. Incident radio communication capabilities within the incident command structure shall include monitoring of incident-assigned frequencies (including mutual aid radio frequencies).

(16) Prior to overhaul, buildings shall be surveyed for possible safety and health hazards. Fire fighters shall be informed of hazards observed during the survey.

(17) During the overhaul phase officers shall identify materials likely to contain asbestos, limiting the breaching of structural materials to that which is necessary to prevent rekindle.

(18) Floatation devices shall be made available to fire fighters at incidents where drowning is a possibility. This is not intended to include pools and hot tubs.

(19) Fire fighters shall not cut the electrical drip loop providing power to the structure nor pull the electrical meter.

(20) Traffic cones or other traffic control devices shall be utilized when vehicular traffic hazards exist at an emergency operation.

[Statutory Authority: RCW 49.17.040, 99-05-080, § 296-305-05001, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060, 96-11-067, § 296-305-05001, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05003 Confined space rescue operations.** (1) Fire departments shall comply with chapter 296-62 WAC, Part M for their own confined spaces.

(2) Fire departments which have been contracted as an outside rescue service provider shall also comply with Part M and in particular the specific provisions of WAC 296-62-14150(2) which requires authorized entrant training and rescue practices from the host's actual permit spaces or representative permit spaces.

(3) Fire departments which have responded or will respond to calls to perform rescue from a noncontracted permit-required confined space are required to have each member of a rescue team practice making permit space rescues at least every 12 months by means of simulated rescue opera-

tions in which they remove dummies, mannequins or actual persons from permit space. A permit is required for the practice permit space entry.

(4) During an actual rescue response, written and/or verbally recorded hazard sizeup will be allowed in lieu of the written permit requirements in WAC 296-62-14507 and 296-62-14509 and shall be completed prior to any entry. This sizeup shall include at a minimum:

(a) Recognition and declaration of the situation as a confined space incident.

(b) Denial of entry to unprotected persons.

(c) Assessment of all readily available confined space documentation, e.g., MSDSs, any existing permit, plans or blueprints of the space.

(d) Assessment of number of victim(s), locations and injury conditions.

(e) Discussion with witnesses, supervisor, etc.

(f) Assessment of any current or potential space hazards, in particular, any hazard(s) which lead to the necessary rescue.

(g) Determination and declaration if body recovery or victim rescue.

(5) At confined space incidents, at least two people outside shall be equipped with appropriate breathing apparatus to act as the back-up team, which shall remain free of the contaminated area in order to rescue disabled fire fighters.

(6) Written documentation of the rescue team's training on the fire department's confined space operating procedures, authorized entrant training, if applicable, the contracted host's confined space program. A record of each of the hazard sizeups shall be maintained for at least one year.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, 02-12-098, § 296-305-05003, filed 6/5/02, effective 8/1/02. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060, 96-11-067, § 296-305-05003, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05005 Rope rescue operations.** (1) Fire departments engaged in rope rescue operations shall comply with the requirements of this section and WAC 296-305-02019.

(2) Employees engaged in rope rescue operations shall be properly trained and qualified by the employer to perform such activities.

(3) Employers shall establish standard operational procedures for rope rescue activities and training.

(4) When engaged in rope activities, employees shall be provided and wear either structural fire fighting helmets and gloves, or helmets that meet ANSI Standard Z89.1, 1986 edition, Class A and B; gloves.

(5) Records shall be maintained of inspections and repairs made to rope rescue equipment.

(a) Equipment shall be inspected after purchase and prior to placing in service, after each use, and at least semi-annually.

(b) Harnesses shall be inspected for worn or broken stitching, rivets worn out of holes, and damage from abrasion, cuts, or chemicals.

(c) Descending/ascending hardware shall be inspected for wear, cracks, distortion, sharp edges, and ease of operation.

(d) Equipment showing damage or wear that can affect employee safety, shall be either repaired prior to further use or retired.

(6) The manufacturer's recommended shelf life of rescue ropes shall be followed. If no shelf life is specified, ropes greater than six years old, whether used or not, shall be taken out of service or destroyed.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060, 96-11-067, § 296-305-05005, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05007 Trench rescue operations.** (1) Fire departments that engage in trench rescue operations shall adopt and maintain a written response program that addresses training and procedures to follow in emergency life threatening situations.

(2) Employees that directly engage in trench rescue operations shall be trained or shall be under the direct supervision of person(s) with adequate training in trench and excavation hazard recognition, equipment use and operational techniques.

[Statutory Authority: RCW 49.17.040, 99-05-080, § 296-305-05007, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060, 96-11-067, § 296-305-05007, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05009 Watercraft rescue operations.**

(1) If a manufacturer's specifications are such that an engineer is required for the operation of a vessel, then one shall be provided.

(2) When fire boats perform rescue activities they shall have two dedicated personnel. Any member not specifically required to operate the vessel, e.g., an operator (pilot) or engineer (if required by the manufacturers specification) may be used as a deck hand. This may include the boat officer if his/her duties do not include operating the fire boat.

(3) Watercraft load capabilities shall not exceed the manufacturer's specifications.

(4) Each fire department shall determine the function of their watercraft; as fire fighting, rescue, or both.

(5) Watercraft operating within navigable waters of the state of Washington (as defined by the United States Coast Guard) shall comply with all of the rules of the United States Coast Guard.

(6) Fire boats operating within navigable waters of the state of Washington (as defined by the United States Coast Guard) shall have a fully dedicated pilot.

(7) The operator (pilot) of the watercraft is responsible for its safe operation.

(8) Training for all personnel shall represent the intent of the employer and physical characteristics of the vessel involved and shall be included in the employer's accident prevention program.

(a) All assigned personnel shall be trained in safe operation of watercraft and the operations the craft is intended to perform.

(b) All employees involved in water rescue shall be trained in water rescue techniques and wear Coast Guard approved personal flotation devices, Type III, minimum.

Exception: Employees working below deck or in enclosed cabins.

(9) All employers operating watercraft in nonnavigable waters shall be responsible for training all employees to local hazards.

[Statutory Authority: RCW 49.17.040, 99-05-080, § 296-305-05009, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05009, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05011 Hazardous materials operations.** Fire departments engaged in emergency response to releases of hazardous substances shall comply with chapter 296-824 WAC, Emergency response to hazardous substance releases.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-305-05011, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05011, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05013 Aircraft rescue and fire fighting.** Fire departments that engage in aircraft rescue and fire fighting operations shall review NFPA, Manual for Aircraft Rescue and Fire Fighting Operations 402M, 1991 edition.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05013, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05501 Fire training.** (1) All members who engage in emergency operations shall be trained commensurate with their duties and responsibilities. Training shall be as frequent as necessary to ensure that members can perform their assigned duties in a safe and competent manner but shall not be less than the frequencies specified in this standard. Minimum training shall be as specified in this part.

(2) Live structural-fire training: Prior to being permitted to participate in live structure-fire training evolutions, the student shall have received adequate training in safety, protective breathing apparatus, fire hose, nozzles and fire streams, ladders, and rescue as defined by the employer.

(a) Strict safety practices shall be applied to all structures selected for live fire training evolutions.

(b) In preparation for live training, an inspection of acquired buildings shall be made to determine that the floors, walls, stairs and other structure components are capable of withstanding the weight of contents, participants and accumulated water.

(c) Removal or neutralization of materials of all hazardous storage and conditions within the structure shall be accomplished.

(i) Closed containers and highly combustible materials shall be removed.

(ii) Oil tanks and similar closed vessels that cannot easily be removed shall be vented sufficiently to eliminate an explosion or overpressure rupture.

(iii) Any hazardous or combustible atmosphere within the tank or other vessel shall be rendered inert.

(iv) Hazards potentially dangerous to participants such as floor openings, missing stair tread and rails, and other such hazards shall be repaired or made inaccessible.

(d) If applicable, floors, railings and stairs shall be made safe. Special attention shall be given to potential chimney hazards.

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(e) Debris hindering the access or egress of fire fighters shall be removed before continuing further operations.

(f) Buildings that cannot be made safe as required by this section shall not be utilized for interior live fire training.

Note: The water supply for any individual live fire training evolution should be assessed based on the extent of the evolution, size and structure of the building and contents to be involved, method of attack to be employed, protection of exposures and reserves for potential contingencies. Separate sources should be used for supply to attack and backup lines.

(g) Prior to conducting actual live fire training evolutions, a preburn briefing shall be conducted for all participants.

(i) All evolutions shall be discussed and assignments shall be made for all crews participating in the training sessions.

(ii) All participants shall have a knowledge and familiarity with the layout of the building.

(h) A safety officer shall be appointed for all live fire training evolutions.

(i) One person shall be designated to control the materials being burned and to ignite the training fire in the presence and under the direction of the safety officer. This person shall not be a student and shall wear full protective clothing, including SCBA.

(j) Unidentified materials such as debris which may burn in unanticipated ways, react violently, or create environmental hazards, shall not be used in live fire training evolutions.

(k) Each participant in a coordinated interior live fire training evolution shall be equipped with full protective clothing and SCBA. All participants shall be inspected by the safety officer to insure all protective clothing and SCBA are being properly worn prior to entry into a live fire training evolution.

(l) All instructors shall be deemed qualified to deliver structural fire fighting training by the employer. The instructor-student ratio shall not be greater than one to five.

(m) Officers shall make a head count both when entering and exiting a building during an actual attack.

(n) Supervisors at the training evolution shall maintain an awareness of the condition of members operating within the span of their control. They shall ensure adequate steps are taken to provide for the safety and health of the participants and relief or reassignment of fatigued persons.

(3) Fire fighters shall be trained in the function, donning and doffing, care, use, inspection, maintenance and limitations of the equipment assigned to them or available for their use.

(4) When fire fighters are engaged in training above the ten-foot level where use of life lines or similar activities are to be undertaken, a safety net shall be erected or other approved secondary means of fall protection such as recommended in chapter 296-155 WAC, Part C-1, Fall restraint and fall arrest, shall be used in lieu of nets.

(5) During wet training exercises, hose meeting the 250 pound annual hose test shall be used.

(6) Training shall be provided to fire fighters and officers in order that they will be knowledgeable in the identification and handling of asbestos containing materials likely to be encountered during a fire response.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05501, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-05503 Summary of training requirements.** (1) Training on noise must conform to chapter 296-817 WAC, Hearing loss prevention (noise), and WAC 296-305-02005.

(2) Training on medical procedures shall conform to WAC 296-305-02501.

(3) Training on respiratory equipment shall conform to chapter 296-842 WAC, Respirators, and WAC 296-305-04001.

(4) Training on employee right-to-know procedures shall conform to WAC 296-800-170, chemical hazard communication program.

(5) Training on overhaul procedures and operations shall conform to WAC 296-305-05001.

(6) Training on wildland fires shall conform to WAC 296-305-07001 through 296-305-07019.

(7) Training on confined space entry and/or rescue shall conform to chapter 296-62 WAC, Part M, Permit-required confined spaces and WAC 296-305-05003.

(8) Live fire training in structures shall conform to NFPA 1403 and this section.

(9) The employer shall provide training and education for all members commensurate with those duties and functions that members are expected to perform. Such training and education shall be provided to members before they perform emergency activities. Fire service leaders and training instructors shall be provided with training and education which is more comprehensive than that provided to the general membership of the fire department.

(10) The employer shall assure that training and education is conducted frequently enough to assure that each member is able to perform the member's assigned duties and functions satisfactorily and in a safe manner so as not to endanger members or other employees. All members shall be provided with training at least annually. In addition, members who are expected to perform interior structural fire fighting shall be provided with an education session or training at least quarterly.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-055, § 296-305-05503, filed 10/3/05, effective 12/1/05; 05-03-093, § 296-305-05503, filed 1/18/05, effective 3/1/05; 03-11-060, § 296-305-05503, filed 5/19/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-05503, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05503, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-06001 Fire service equipment.** (1) All portable equipment shall be inspected routinely to ensure that it is ready for use.

(2) Any defective equipment shall be removed from service.

(3) Nylon utility straps or straps of equivalent strength should be used instead of hose belts. The utility strap shall be of one-inch nylon, or equivalent belting, with a four-inch overlap and sewn with polyester thread and shall measure at least 102 inches on the outside circumference.

(4) The load capacity shall be stenciled on each portable jack and the load capacity shall not be exceeded.

(5) The instruction plate on portable jacks shall be maintained in a legible condition.

(6) Portable powered cut-off saws (rescue saws) shall be used in accordance with the manufacturer's recommendations.

Exception: The lower blade guard described in WAC 296-24-65501 (1)(a) is not required on hand-held portable powered cut-off saws used by fire/rescue personnel for rescue procedures and/or roof ventilation for smoke removal, provided the operator is wearing appropriate eye, face, head, and body protection as specified in WAC 296-305-02001 through 296-305-02013. This exception also applies to qualified persons (e.g., instructors) wearing personal protective equipment as described herein to instruct personnel in safe roof ventilation/rescue techniques.

(7) When not in use, the cutting teeth on a chain saw shall be covered either by an old section of hose, a wooden scabbard, or an equivalent method.

(8) All axes worn by employees shall be provided with a scabbard to guard against injury from the blade and pick of the axe.

(9) The guards on smoke ejectors, as supplied by the manufacturer, shall not be removed and the operator of the ejector shall wear gloves.

(10) Acetylene cylinders. Handling, storage and utilization of acetylene in cylinders shall be in accordance with the Compressed Gas Association Pamphlet G-1 - 1966 edition.

(11) Powder activated life-line guns and accessories shall be stored in a box or container equipped with a lid or cover.

(a) The box shall be kept closed when not in use.

(b) A loaded life-line gun shall not be placed in the storage box.

(c) Instruction books, cleaning kits and hand tools needed for maintenance or breakdown purposes shall be kept in the life-line gun storage box.

(d) The words "powder activated tool" shall be conspicuously printed on the top of the storage box.

(12) Abrasive blades in storage shall be protected from contact with water, liquids, petroleum products and their fumes.

(13) Fiber rope that has been subjected to injurious chemicals or excessive heat shall not be used for load carrying purposes.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06001, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06001, filed 11/30/83; Order 77-20, § 296-305-06001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06003 Testing fire service equipment.**

(1) When testing fire hose, a restricted orifice disc having not more than a 25% opening, shall be installed on the pumper discharge port. Or in the alternative, the pumper discharge valve may be opened not more than 25% to insure a minimum volume of water in case of a bursting hose.

(2) Safety nets shall be tested annually by dropping a weight of not less than 400 pounds from the highest point to be used above the net. The test weight object may consist of two tightly tied rolls of two and one-half inch hose, each 100 feet long, or any other object having similar weight and dimension.

(a) The net suspension system shall be designed and constructed with a safety factor of four and as a minimum, shall

withstand the test loading without permitting contact between the net and any surface or object below the net.

(b) Forged steel safety hooks or shackles shall be used to fasten the net to its supports.

(c) Training requiring safety net protection shall not be undertaken until the net is in place and has been tested by the weight of three fire fighters on the net.

(d) Safety nets shall extend eight feet beyond the edge of the work surface.

(e) The mesh size of nets shall not exceed six inches by six inches.

(f) All nets shall meet accepted performance standards of 17,500 foot pounds minimum impact resistance as determined and certified by the manufacturer, and shall bear a label of proof test.

(g) Edge ropes shall provide a minimum breaking strength of 5,000 pounds.

(3) Life belts shall meet or exceed the strength requirements of ANSI A10.14 - Requirements for Safety Belts, Harnesses, Lanyards, Lifelines and Drop Lines for Industrial Use. Life belts shall be inspected after each use and not less than semi-annually in accordance with manufacturer's instructions.

(4) Rescue ropes shall be used for rescue purposes only.

(5) Rescue ropes shall meet the following requirements:

(a) Rescue ropes shall be constructed of rot-proof fiber with a melting point of not less than 400 degrees F;

(b) They shall be of abrasion resistant construction;

(c) They shall have a minimum breaking strength of not less than 9,000 pounds.

(6) Rescue ropes shall be inspected after each use and not less than semi-annually in accordance with manufacturer's instructions.

(7) The method of testing a life line gun shall be in accordance with the manufacturer's recommended procedure.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06003, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06003, filed 11/30/83; Order 77-20, § 296-305-06003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06005 Ground ladders.** This section establishes the minimum requirements for the construction, care and use of the common types of ladders used in fire combat.

(1) Ladder locks or pawls on extension ladders shall be so fastened or secured to the beams that vibration and use will not cause loosening of bolts and nuts.

(a) Pawls or ladder locks shall be so constructed that the hook portion of the pawl that engages the rung shall have sufficient bearing surface or area to prevent the hook from cutting into rungs when engaged.

(b) Such hooks shall be properly finished to eliminate sharp edges and points.

(2) Staypoles or tormenters shall be furnished on all extension ladders extending over forty feet. Staypole or tormenters spikes shall not project beyond the butt of the ladder when nested.

(3) All ladders shall be stored in a manner to provide ease of access for inspection, and to prevent danger of accident when withdrawing them for use.

(4) Fire fighters shall climb and descend ground ladders with the fly in, for safety purposes, when not in conflict with the manufacturer's recommendations. Even when ladders are routinely used in the fly out configuration, in adverse conditions fire fighters shall be permitted to climb and descend ground ladders with the fly in to assure secure footing.

(5) All ladders regardless of type shall be inspected thoroughly after each use. Records shall be kept of the inspections and repairs.

(6) The following metal ladder components shall be checked:

(a) Rungs for welds, damage or weakness caused by overloading or bumping against other objects, looseness and cracks, etc.

(b) Beams for welds, rivets and bolts, signs of strain or metal fatigue, and deformation from heat or overloading.

(c) Bolts and rivets for tightness.

(d) Butt spurs for excessive wear or other defects.

(e) Halyards for the same defects listed for wood ladder halyards and cable halyards, for fraying or breaking.

(f) Heat sensor label, when provided, for change indicating heat exposure.

(7) The following wood ladder components shall be checked:

(a) Bolts for snugness and tightness without crushing the wood.

(b) Beams for dark streaks; when a wood ground ladder develops dark streaks in the beams, the ladder shall be removed from service and service tested as specified in this chapter, prior to further use.

(c) Protective varnish finish for damage or wear, at least once a month and redone annually or at such frequency as specified by the manufacturer. If the protective finish becomes charred or blistered, the ladder shall be removed from service and service tested as specified in this chapter, prior to further use.

(8) Methods of fastening ladder halyards, either of wire or fibrous material, shall be in a manner that the connection is stronger than the halyard.

(9) Any defect noted in above visual inspection shall be corrected prior to testing.

(10) Every portable ladder shall be tested following the correction of defects disclosed by the visual inspections.

(11) New ground ladders purchased after the effective date of this chapter shall be constructed and certified in accordance with the requirements of NFPA Standard 1931, 1994 edition.

(12) All fireground ladders shall be inspected and maintained in accordance with the requirements of the 1994 edition of NFPA 1932. When metal ground ladders are tested, they shall be tested in accordance with the strength service testing procedures of the 1984 edition of NFPA 1932.

(a) Extension ladders that were constructed prior to the adoption of the 1984 edition of NFPA 1931, may, when tested in accordance with this chapter, be tested with a minimum test load of 400 pounds and a preload of 300 pounds. Ladders tested under this exception shall be used with a maximum load limit of 500 pound distributed or 400 pound con-

centrated. Ladders shall be tested in the configuration they are used.

(b) Additional requirements for wooden ground ladders; whenever any wood ground ladder has been exposed or is suspected of having been exposed to direct flame contact the ladder shall be service tested as specified in section 5-2 of NFPA Standard 1932, 1984 edition.

Note 1: Hardness testing and eddy current NDE testing is not required in the fire department annual maintenance inspection unless the individual ladder has been subjected to a high heat exposure which could have annealed the metal and diminished the structural integrity. The ladder manufacturer's recommendations should be followed with respect to hardness and eddy current testing.

Note 2: Testing should follow the recommended procedures taught by Washington State Fire Protection Bureau.

Additional references: Chapter 296-24 WAC, Part J-1 and WAC 296-800-290.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-06005, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-06005, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06005, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06005, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06005, filed 11/30/83; Order 77-20, § 296-305-06005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06007 Electrical.** (1) Temporary lighting with the use of 110 - 120 VAC equipment.

(a) All lighting equipment shall be provided with heavy duty flexible cords with SO or SJ jackets or equivalent. All lighting equipment shall be used with heavy duty flexible extension cords with 12-3 conductors with SO or SJ jackets or equivalent.

(b) Electrical cords shall have weather tight bodies and caps, 20 amp rated at 120 VAC with appropriately sized plugs and sockets.

(c) Temporary lights that are used in moist, damp, and/or other hazardous locations shall be approved for the purpose.

(d) Temporary lights shall be constructed so that water cannot enter or accumulate in wireways, lampholders or other electrical parts.

(e) Temporary lights that are used in moist and/or other hazardous locations shall have 120 VAC single-phase 15 and/or 20 amp in-line resettable ground fault circuit interrupters.

(f) Temporary lights shall be equipped with a handle and be insulated from heat and possible electrical shock.

(g) Temporary lights shall not be suspended by their electrical cords unless cords and lights are designed and labeled for this means of suspension.

(h) Temporary lights shall be protected by guards of a nonconductive or insulated material to prevent accidental contact with the bulb.

(2) 120 VAC cord reels shall be approved for use in damp or hazardous locations.

(a) Bodies and caps shall be weather tight, 20 amp rated at 120 VAC.

(b) Cords on cord reels that do not exceed 150 feet in length shall be SO or SJ type jackets or equivalent.

(c) Cords that exceed 150 feet in length on reels, shall have 10-3 conductors.

(d) Cord reels that are not permanently mounted on a vehicle shall be insulated from the ground when in use.

(3) Twelve volt portable type hand lanterns shall be constructed of molded composition or other type approved for the purpose.

(a) Portable hand lanterns used in moist and/or other hazardous locations shall be operated at a maximum of 12 volts.

(b) Hand lamps shall be equipped with a handle and a substantial guard over the bulb and attached to the lampholder.

(4) Portable and vehicle-mounted generators.

(a) Portable generators. Under the following conditions, the frame of a portable generator shall not be required to be grounded and shall be permitted to serve as the grounding electrode for a system supplied by the generator:

(i) The generator supplies only equipment mounted on the generator or cord-connected and plug-connected equipment through receptacles mounted on the generator, or both, and

(ii) The noncurrent-carrying metal part of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

(b) Vehicle-mounted generators. Under the following conditions, the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

(i) The frame of the generator is bonded to the vehicle frame; and

(ii) The generator supplies only equipment located on the vehicle and/or cord-connected and plug-connected equipment through receptacles mounted on the vehicle or on the generator; and

(iii) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

Additional references: Article 250 National Electrical Code. Chapter 296-24 WAC, Part L and WAC 296-800-280.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-06007, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 99-05-080, § 296-305-06007, filed 2/17/99, effective 6/1/99. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06007, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06007, filed 11/30/83; Order 77-20, § 296-305-06007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06501 Requirements for fire station facilities.** WAC 296-305-06501 through 296-305-06519 pertain to all fire department facilities as defined in WAC 296-305-01005.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06501, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06501, filed 11/30/83; Order 77-20, § 296-305-06501, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06503 General requirements.** (1) Stations and administrative offices shall comply with the requirements of the general occupational health standards, WAC 296-800-210, Lighting in the workplace.

(2) Every new fire station built after the effective date of this chapter, whether manned or unmanned, shall be

equipped with an approved emergency lighting system that will light dormitories, hallways, and apparatus bay areas in case of electrical power failure.

(3) No new fire station or new addition to an existing fire station, shall incorporate sliding poles or slides in their design or construction.

(4) The requirements of chapter 296-24 WAC, Part B-2, Window washing, shall be followed when employees are engaged in window washing operations.

(5) All new fire stations and other new fire department facilities which contain sleeping quarters shall be fully protected with automatic sprinkler systems.

(6) All existing fire stations and existing fire department facilities with sleeping quarters, that undergo a major renovation that consists of more than sixty percent of the assessed evaluation of the existing structure shall be fully protected with automatic sprinkler systems.

(7) Eye protection shall be worn when charging, changing or adding fluid to storage batteries. Personnel that will be charging storage batteries shall be qualified to perform this function by the employer. See WAC 296-24-23015.

(8) Stairway tread shall be of a nonskid design. Examples of nonskid: Grip strut grating, serrated edge grating, metal grating, aluminum safety tread, abrasive metal stair tread, or pressure sensitive nonskid type.

(9) In existing facilities where sliding poles or slides are used, the pole or slide hole shall be guarded in such a manner as to prevent anyone from walking directly into the pole or slide hole opening.

(10) To absorb the shock to sliding employees, the bottom of all slide poles or slides shall have a three-foot diameter cushioned rubber mat, or its equivalent.

(11) Nothing shall be stored or placed at the bottom of a pole or slide hole for a radius of three feet from the pole. Doors shall not protrude within three feet of the pole or slide.

(12) Stair and landing protection: Stairways, guardrails, landings, and handrails shall be constructed to the requirements of chapter 19.27 RCW the State Building Code Act, and chapter 296-24 WAC, Part J-1.

(13) A standard guard railing for a landing platform shall include a toeboard, which is a vertical barrier, at floor level erected along exposed edges of a floor opening, wall opening, platform, runway or ramp to prevent falls of material.

(14) Any new facility, or addition, alteration, or repair to an existing facility shall be in compliance with chapter 19.27 RCW, the State Building Code Act.

(15) New stations containing a kitchen, and station kitchens remodeled after the date of this chapter, shall have an alarm activated service disconnect of fixed cooking appliances.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-06503, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06503, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06503, filed 11/30/83; Order 77-20, § 296-305-06503, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06505 Sanitation, disinfection, cleaning, and storage areas.** (1) Fire departments shall provide facilities for disinfecting, cleaning, and storage.

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(2) A designated cleaning area shall be provided for under the fire department's exposure control plan for the cleaning and disinfecting of protective equipment, portable equipment, and other clothing.

(a) Fire departments that engage in emergency medical operations shall provide or have access to disinfecting facilities for the cleaning and disinfecting of emergency medical equipment.

(b) Disinfecting shall not be conducted in fire station kitchen, living, sleeping, or personal hygiene areas.

(c) Disinfecting facilities in fire stations shall be vented to the outside environment, and designed to prevent contamination of other fire station areas.

(d) The disinfecting facility shall contain a sink with hot and cold water faucets. All surfaces shall be nonporous surfaces.

(e) Handwashing facilities shall be readily accessible to members. Handwashing facility means a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines. When provision of handwashing facilities is not feasible, the employer shall provide either an appropriate antiseptic hand cleaner in conjunction with clean cloth/paper towelettes or antiseptic towelettes.

(3) Protective clothing or equipment that needs to be decontaminated and/or disinfected shall not be allowed in any kitchen, living, sleeping, or personal hygiene area.

(4) The designated cleaning area shall be physically separate from areas used for food preparation, cleaning of food and cooking utensils, personal hygiene, sleeping, and living areas.

(5) Drying areas for protective clothing shall be well ventilated.

(6) Storage areas: Emergency medical supplies and equipment stored in fire stations, other than that stored on vehicles, shall be stored in a dedicated enclosure and maintained per manufacturer's instructions.

(7) Reusable emergency medical supplies and equipment, protective clothing, and protective equipment shall not be stored in kitchen, living, sleeping, or personal hygiene areas, nor shall it be stored in personal clothing lockers.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06505, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06505, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06505, filed 11/30/83; Order 77-20, § 296-305-06505, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06507 Sleeping areas.** (1) All sleeping areas in fire stations shall be separated from vehicle storage areas by at least one-hour fire resistive assemblies. Compliance with this section shall be required within three years of the effective date of this chapter.

(2) Sleeping areas shall be protected by smoke detectors.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06507, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06507, filed 7/6/88; Order 77-20, § 296-305-06507, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

[Title 296 WAC—p. 2357]

**WAC 296-305-06509 Apparatus areas.** (1) Three feet of clearance shall be maintained around apparatus parked within the station where the station's width permits.

(2) All fire stations built after December 17, 1977, shall have a minimum of three feet of clearance around the apparatus, which shall be maintained free of any storage or obstruction.

(3) The station's apparatus floors shall be kept free of grease, oil, water and tripping hazards.

(4) Floors shall have slip-resistant surfaces on areas where personnel would normally mount or dismount apparatus.

(5) No Class I or Class II flammable liquids shall be used for cleaning purposes to remove grease or dirt from apparatus.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06509, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06509, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06509, filed 11/30/83; Order 77-20, § 296-305-06509, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06511 Indoor air quality.** Air quality shall be consistent with WAC 296-62-075 through 296-62-07515, Air contaminants and WAC 296-800-240, Environmental tobacco smoke.

Note: For extended work shifts all eight-hour PEL's shall be time-weighted to adjust for additional worker exposure during extended work shifts.

(1) If indoor air monitoring indicates over-exposure to contaminant PEL's, engineering controls shall be utilized to reduce fire fighter exposure to the lowest feasible level.

(2) All fixed internal combustion equipment such as, but not limited to emergency generators, shall be effectively exhausted to the exterior of the fire stations.

(3) All facilities dedicated to the maintenance and repair of internal combustion equipment shall have means for effective ventilation to the exterior of the building.

(4) All fire stations built after January 1, 1997, shall be designed and constructed to conform to ACGIH ventilation recommended criteria for exhaust of internal combustion engines.

Additional reference: Industrial Ventilation Manual of Recommended Practices ISBN No.: 0-936712-65-1.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-06511, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06511, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-06511, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06513 Refueling areas.** (1) Refueling pumps, if installed, shall be in accordance with the provisions of the Uniform Fire Code and WAC 296-24-33015.

(2) Dispensing of Class 1 liquids shall be as required in the Uniform Fire Code.

(3) Spillage of oil or fuel shall be properly disposed of or completely evaporated and the fuel tank cap replaced before restarting engine.

(4) Fueling areas shall be posted - "NO SMOKING - STOP YOUR MOTOR."

[Title 296 WAC—p. 2358]

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06513, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-06513, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06515 Hose drying towers.** (1) The floor openings on hose tower platforms shall be equipped with a forty-two inch guardrail with mid-rail and shall be capable of withstanding a force of 250 pounds applied in any direction at any point on the top rail. The work platform shall be equipped with toeboards.

(2) The requirements for offset ladder platforms and ladder cage guards, when ladders extend beyond twenty feet, shall apply to hose drying towers.

(3) Ropes and attachments used to hoist hose in the hose towers shall have a breaking strength of 1500 pounds for a safe load strength of 300 pounds (five-to-one safety factor).

(4) Approved head protection shall be worn by all persons in the hose tower whenever hose handling/hanging operations are taking place.

(5) Ropes utilizing a pulley block shall be appropriately sized for the sheave to prevent possible jamming or damage to the rope.

Additional reference: Chapter 296-24 WAC, Part J-1 and chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-305-06515, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06515, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-06515, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06517 Drill tower training facilities.**

(1) Permanent fixed ladders on the outside of drill towers and drill buildings are exempt from the requirements of offset platform landings and ladder cage guards.

(2) Drill tower construction and operations shall comply with the following:

(a) Burn buildings used for live fire training shall be engineered for such use.

(b) Drill towers shall not be used for live fire training except when burn rooms are provided.

(c) Burn rooms, if included in the building, shall be engineered into drill towers.

(d) All walking surfaces in the drill tower shall be slip resistant.

(e) Railings shall be designed with a four-to-one safety ratio for 250 pound fire fighters who may be operating a charged hose line on the fire escape.

(f) Rappelling anchors shall be engineered to support 4500 pounds per person supported by the anchor.

(g) Rappelling anchors shall be readily identifiable.

(h) Rappelling anchors shall be certified by a structural engineer.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06517, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06517, filed 11/30/83; Order 77-20, § 296-305-06517, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06519 Fire station equipment and tools.** (1) Equipment and tools in maintenance shops shall be guarded as required by the guarding provisions of chapter

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296-806 WAC, Machine safety, and chapter 296-807, Portable power tools.

(2) Exposure of fan blades. When the periphery of the blades of a fan is less than ten feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than one-half inch. This provision shall not apply to residential ceiling fans.

(3) Abrasive wheels and grinders.

(a) All abrasive wheels and grinders, shall be guarded as required by chapter 296-806 WAC, Machine safety.

(b) Goggles or face shields shall be used when grinding.

(c) Abrasive and composite blades shall be stored and protected against exposure to fuel and oil.

(d) Work rests on bench mounted abrasive wheel grinders shall be used to support the work. These shall be of rigid construction and designed to be adjustable to compensate for wheel wear. Work rests shall be kept adjusted sufficiently close to the wheel with a maximum opening of one-eighth inch to prevent the work from being jammed between the wheel and the rest. Adjustment of the work rest shall not be made while the wheel is turning.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-305-06519, filed 6/29/04, effective 1/1/05. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06519, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-07001 Wildland fire operations. (1)**

This section shall apply to all personnel and agencies called on to provide services at any fire defined as a "wildland fire."

(2) This section shall not apply to suppression action taken on fires prior to the fire meeting the definition of a "wildland fire."

(3) Employers shall provide at no cost to the employee, the protective equipment and protective clothing required by this chapter. Personnel performing suppression actions on a wildland fire shall wear the provided protective clothing as directed by their fire department's procedures/guidelines.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07001, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07001, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07001, filed 11/30/83; Order 77-20, § 296-305-07001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07003 Personal protective clothing and equipment for wildland fire fighting. (1)**

Protective apparel and equipment for wildland fire fighters shall be designed to provide thermal protection for the fire fighters against external heat sources with flame resistant clothing and equipment without creating high heat stress loads due to the prolonged work periods they experience. Members performing suppression on a wildland fire shall wear a provided protective clothing ensemble as directed by their employer. The combined protective clothing ensemble includes:

(a) Hardhat/helmet

(b) Upper and lower torso clothing

(c) Gloves

(d) Goggles

NFPA Standard Protective Clothing and Equipment for Wildland Fire fighting 1977, 1993 edition shall serve as a

(2007 Ed.)

guideline for determining performance characteristics of this clothing.

(2) As a minimum, members shall wear provided leather lace-up boots of sturdy construction which shall extend upward a minimum of 8 inches above the top of the sole, which shall be slip resistant.

(3) Additional personal protective equipment to be provided and worn shall include a fire shelter as directed by the incident commander.

(4) Wildland protective clothing shall comply with this standard within two years of the effective date of this chapter.

(5) Personnel operating Type 1 or Type 2 engines assigned to structural protection will carry structural protective clothing on their assigned apparatus.

(6) Wildland personnel protective clothing shall not be used for interior structural fire fighting.

(7) Persons provided fire shelters shall be trained in their use and shall receive refresher training at least annually.

(8) Personnel wearing full structural fire fighting clothing while engaged in fighting wildland fires shall not expend more than one hour before rotating to rest and rehabilitation. Agencies may rotate crews to avoid the one-hour benchmark when containing and controlling wildland fires.

(9) Fire departments shall establish written procedures for the care, use, maintenance, and retirement criteria for protective equipment in conjunction with the manufacturers' recommendations.

(10) Fire departments shall establish written procedures for the use of protective clothing and protective equipment while performing fire fighting activities.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07003, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07003, filed 11/30/83; Order 77-20, § 296-305-07003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07005 Respiratory protection for wildland fire fighters.**

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07005, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07005, filed 11/30/83; Order 77-20, § 296-305-07005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07007 Wildland personnel accountability. (1)**

Wildland fire fighters shall not be required to wear personal alerting devices except when wearing self contained respiratory equipment.

(2) An officer shall maintain positive communication with any individual during those times that the member is assigned an ancillary fire fighting task (examples would include, but are not limited to, scout, safety officer, or watch person).

(3) Wildland fire fighters shall work in teams of two or more while working on or near the fire line of an active fire unless they are in visual or voice contact with an officer.

(4) On initial attack fires, the incident commander shall:

(a) Maintain the name and location of all personnel on the incident.

(b) On extended attack fires, ensure the maintenance of the name and location of all personnel within their unit, division, or branch.

(c) Transfer/confirm personnel and unit information to the appropriate incident command section (ICS) command staff as soon as possible.

(d) Ensure that personnel and unit information is recorded in the command post as soon as possible.

(5) When a fire "blows up" or makes a run that crosses planned control lines, officers shall conduct an accounting of all personnel assigned to fire suppression and report any missing personnel to the incident commander.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07007, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07007, filed 11/30/83; Order 77-20, § 296-305-07007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07009 Apparatus standards for wildland fire fighting.** This section applies to wildland fire apparatus meeting the NIIMS ICS typing of a Type 3 through Type 7 engine, and intended for use combating fires occurring in natural vegetation or occurring in natural vegetation and threatening improvements. See Appendix D for equipment types.

(1) In a wildland fire, an engine may provide the primary protection for a crew in the event of unexpected fire behavior or an action that places the engine crew in a position of being exposed to heat and smoke.

(2) Apparatus speed shall be determined to be safe if in the judgment of the officer in charge, the following are taken into consideration:

(a) The particular wildland fire attack methods being utilized including, but not limited to the nature of the fire, the type of terrain, weather conditions, equipment conditions, and whether personnel are positioned in wildland fire fighting enclosures;

(b) The forgoing provision shall not relieve a driver from the duty to drive with due regard for the safety of all persons in all conditions;

(c) Nor shall such provision protect the driver from the consequences of his/her reckless disregard for the safety of others.

(3) Because of the sheltering offered by an engine, the following minimum standards shall be complied with:

(a) The number of individuals working/assigned as an engine crew shall not exceed the manufacturer's cab capacity.

(b) Any time an engine is moved when not directly attacking a fire, personnel shall ride in the vehicle's enclosed cabin area, in a seat-belted location, or be off the vehicle.

(c) Any time engines are used in a mobile attack configuration, and personnel other than the driver are on the apparatus, personnel shall ride in the manufacturer's enclosed cabin, or use the personnel restraints and enclosures identified in WAC 296-305-07011.

(d) All personnel working on or around engines in a ground mobile attack mode or in riding positions shall have visual or voice contact with the driver.

(e) Vehicles operating in smoke or dust shall have their headlights, and if so equipped, a flashing or rotating roof light illuminated.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07009, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-07009, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07011 Occupant restraints and enclosures for wildland fire fighting.** (1) While in motion, the driver and passengers in the cab shall wear seatbelts.

(2) Seatbelts shall comply with U.S. Department of Transportation, Part 49 CFR, Section 571, Standards 209 and 210.

(3) Passengers on wildland vehicles shall use a safety belt or a short lanyard securely connected to the apparatus.

(a) Safety belts or lanyards shall be secured to an anchorage or structural member capable of supporting a minimum dead weight of 1500 pounds per person or a 4:1 safety factor.

(b) Safety lanyard lengths shall not allow for the fire fighter to reach the ground.

(4) Safety belts shall be constructed and maintained in compliance with ANSI A10.14-1975.

(5) Lanyards shall be a minimum of one-half inch nylon or equivalent with a nominal breaking strength of 5400 pounds.

(6) The structural components for wildland vehicle enclosures shall be constructed of metal tubing not less than 1 inch in diameter, capable of supporting a minimum of 1500 pounds per person, a 4:1 safety ratio or the equivalent. This applies to vehicle enclosures manufactured after the effective date of this chapter.

(7) The enclosure shall be constructed to a minimum toprail height of forty-two inches and shall include a midrail and either a toeboard at least four inches high or a bottom rail a maximum of six inches from the platform.

(8) Access door(s) and latching mechanisms to tail board enclosures shall be constructed and mounted to achieve structural integrity comparable to the remainder of the enclosure.

(9) A strap or butt-bar utilized for the fourth side of the enclosure shall be a minimum of a four-inch nylon strap capable of supporting 1500 pounds dead weight.

(10) Fire fighters while actively fighting a fire in the mobile attack mode shall remain in a three-sided enclosure and use a safety lanyard. When actively fighting a fire in the mobile attack mode, fire fighters shall remain in a four-sided enclosure but the use of a lanyard is optional and should follow the fire department's operating procedures.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07011, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-07013 Equipment for wildland fire fighting.**

Note: Equipment is considered in this section as those items not configured as a part or portion of the vehicle body.

(1) All equipment on an apparatus shall be carried in an enclosed compartment or otherwise securely mounted on the apparatus and guarded, so that individuals can not accidentally come in contact with equipment that may injure them.

(2) All hand tools, when not in use, shall have appropriate covers and guards to prevent injury.

(3) Wildland fire fighters whose duties require them to operate a power chain saw shall wear flexible ballistic nylon pads, sewn or otherwise fastened into the trousers, or other

equivalent protection that shall protect the vulnerable areas of the legs. Additional trouser, eye, hearing, face and head protection as required by this chapter shall be worn.

(4) Employees shall not use the chainsaw to cut directly overhead, or at a distance that would require the operator to relinquish a safe grip on the saw.

(5) Only personnel trained in firing equipment shall handle and use such equipment, and observe the manufacturers' recommendations.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07013, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-07015 Aircraft operations for fighting wildland fires.** (1) Whenever fixed wing and rotary wing aircraft are being utilized on an incident, personnel trained in air operations management shall be assigned by the incident commander/operations section chief.

(2) Prior to the initiation of air operations, all personnel operating in close proximity to an air drop shall be notified of such activity.

(3) Personnel shall not intentionally operate in an area where it can reasonably be expected that they may be hit with retardants or suppressants from fixed wing or rotary aircraft.

(4) Radio communications shall be maintained between an aircraft/air attack officer and the appropriate ground officer.

(5) Personnel assigned to ride in rotary wing aircraft shall be briefed in the correct approach, riding and off-loading procedures for the particular type of aircraft.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07015, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-07017 First aid for wildland fire fighters.** (1) At all wildland fires, members shall be provided with a minimum of one quart per two-hour time period of electrolyte drinks or potable water.

(2) Officers at wildland fires shall be trained in the symptoms of heat-related disorders and shall observe their crews for such behavior. Appropriate action shall be taken in the event a crew member displays such symptoms.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07017, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-07019 Training for wildland fire fighting.** (1) This section shall apply to all personnel and agencies called on to provide services at any fire defined as a "wildland fire."

(2) This section shall not apply to suppression actions taken on fires prior to the fire meeting the definition of a "wildland fire."

(3) Suppression personnel assigned to a wildland fire shall be trained to a NWCG Fire Fighter level II or a comparable class of training.

(a) "Comparable" training shall be determined by the employer.

(b) Nothing in this section shall preclude the use of local residents, affected parties or contracted fire fighting resources to suppress wildland fires if they are under the direct supervision of a qualified fire line officer.

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(4) Supervisory personnel shall be trained to a level commensurate to the position and responsibility they are to assume.

(5) All personnel will be trained and capable of demonstrating competency in utilizing the Incident Command System (ICS).

(6) All suppression personnel shall annually review the Standard Operating Safety Procedures. See Appendix D.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07019, filed 5/10/96, effective 1/1/97.]

**WAC 296-305-08000 Appendices.** These appendices are nonmandatory and are included to reference and information purposes only.

Appendix A — Recommended cleaning procedures for protective turnout clothing and station uniforms.

(1) Protective clothing should be washed separately from other garments.

(2) Do not use chlorine bleach (sodium hypochlorite) as this will adversely affect the tear strength of your protective clothing and lessen its life. Oxygenated bleaches such as Liquid Clorox II, and Vivid may be used.

(3) Protective clothing may be spot treated or pretreated for hard to remove stains with products such as liquid Spray and Wash, liquid Tide, liquid dishwashing detergent or liquid Shout.

Note: The use of brand names is intended only to indicate a type of cleaning agent. All products listed by name must be used in accordance with the manufacturer's recommendations. Use of a brand name does not constitute an endorsement nor does omission of a particular product brand imply that a product is inferior. Solvents should not be used as they lessen the life of the garment, reduce visibility on the trim, and degrade leather.

(4) When pretreating or spot treating a garment, apply the detergent onto the soiled area. Gently rub the fabric together until a light foam appears on the surface. Use a soft bristle brush (toothbrush type) and scrub the area for about one and one-half minutes. Reapply liquid detergent onto the soiled area and place the garment into the washing machine.

(5) When cleaning turnout clothing the garment should be turned inside out, the hooks and dees fastened, the liner removed, and the garment placed in a laundry bag. These instructions can be used for cleaning any wash loads in a large capacity (sixteen gallon) top loading or front loading machine. Load the machine with any one of the following combinations - do not overload:

- (a) One protective coat and one pair of trousers.
- (b) Two protective coats.
- (c) Two protective pair of trousers.

Note: Heavily soiled garments should be treated as outlined in (4).

(6) While the washing machine is filling with hot water (temperature between 120 degrees F and 130 degrees F), add one-half cup (four ounces) of liquid oxygenated bleach and one cup (eight ounces) of liquid detergent.

- (a) Fill washing machine to highest water level,
- (b) Add garments to be washed,
- (c) Set washing machine for normal cycle, cotton white, or similar setting.

(d) Machines should be programmed for a double rinse. If the machine will not automatically double rinse, a com-

plete second cycle can be run without adding detergent or oxygenated bleach. Double rinse helps remove any residual dirt and ensures detergent removal.

(e) Remove garments from washing machine when done and dry by hanging in a shaded area that receives good cross ventilation, or hang on a line and use a fan to circulate air. A water extractor may be utilized.

(f) After the garments have been removed, run the laundry machine empty or with a dummy (rag) load with detergent at least once; but preferably several times to purge the machine of any residue.

(7) Inspect and examine the trim as to the effectiveness of the trim performance under daytime and nighttime conditions. It is important that a high visibility be maintained at all possible orientations to the light source.

(8) The above procedures can be used for any article of clothing issued that is not contaminated with bloodborne pathogens or any other infectious disease. For clothing exposed to hazardous materials, consult the manufacturer or the appropriate decontamination document.

(9) Procedure for clothing (except wool clothing) that has been exposed to bloodborne pathogens or infectious diseases.

(a) Disposable gloves should be used when handling contaminated clothing.

(b) Each station should have an area designated for the cleaning of equipment. The area designated should not be near kitchen, living, sleeping, or personal hygiene areas.

(c) Contaminated clothing should be handled as little as possible with a minimum of agitation. Contaminated clothing should be cleaned as soon as possible. When the on-coming shift has to clean contaminated clothing for the off-going shift, all contaminated clothing should be stored in red biohazard bags, properly sealed to prevent the spread of potential contamination.

(d) To clean clothing that has been contaminated, a germicidal detergent should be used. Such germicidal should be EPA approved and effective as staphylocidal, pseudomonacidal, virucidal, and fungicidal detergent.

(e) The germicidal detergent is intended to be a complete disinfecting and cleaning agent when mixed according to the manufacturer's directions. Do not add any chemical or detergent to the germicidal solution. After the clothing has been disinfected the clothing should be washed as outlined under normal use.

(f) Wool uniforms should be spot cleaned, placed in the red biohazard bags and sent to an industrial laundry for cleaning.

(10) Helmets, gloves, hoods, and boots should be cleaned as follows:

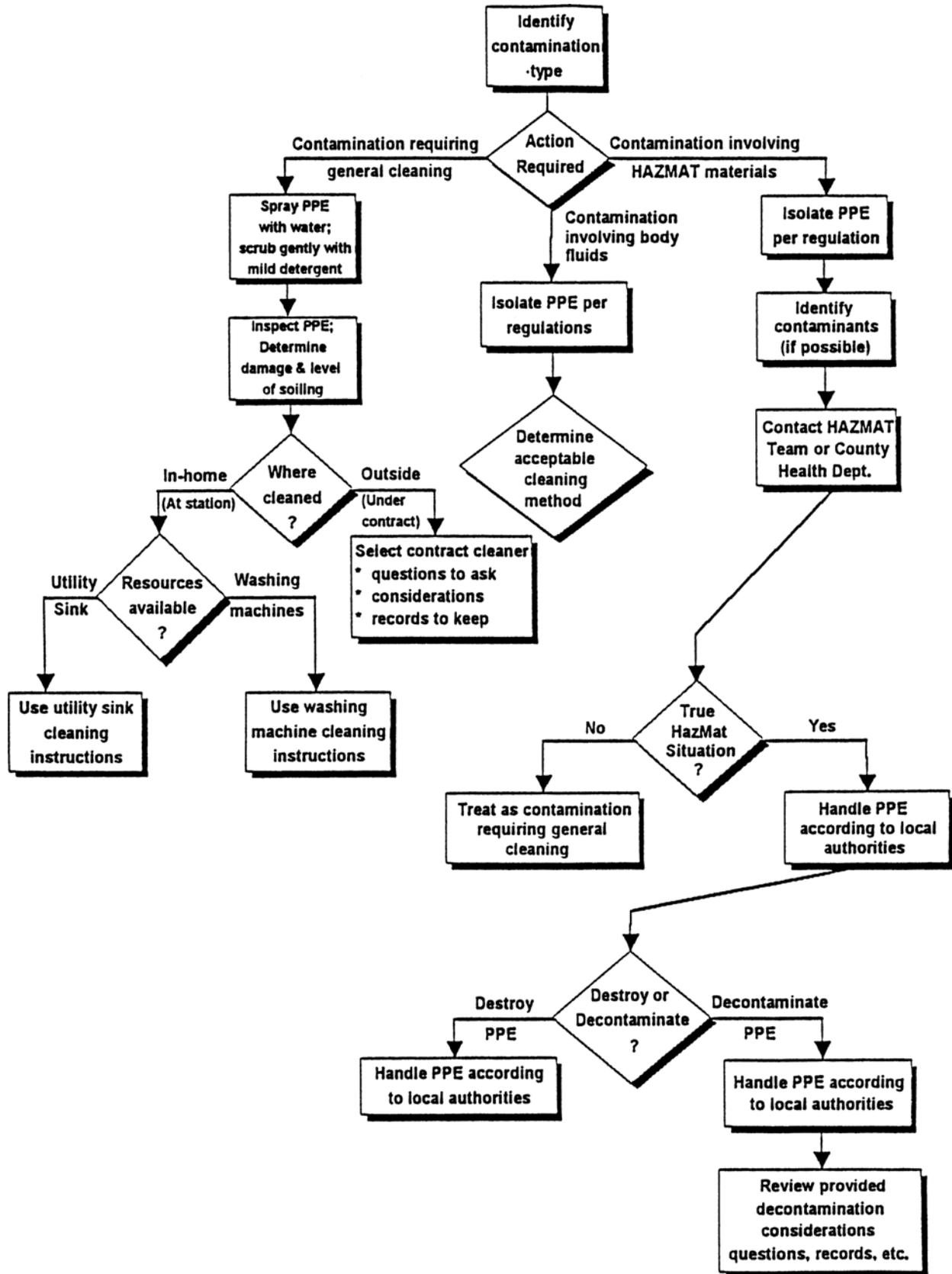
(a) Pre-clean using a germicidal solution and scrub all contaminated areas with a soft bristled brush. Rinse with clean water. Dispose of the pre-cleaning solution by pouring it down the drain in the cleaning area.

(b) Using a fresh germicidal solution, repeat the above procedure allowing the areas to remain wet for a minimum of fifteen minutes. Double rinse with clean water and air dry. Dispose of the solution by pouring it down the drain in the cleaning area.

(c) For gloves, use a third fresh water rinse, squeezing and rinsing several times. Dispose of the solution by pouring it down the drain in the cleaning area.

(11) Front loading industrial laundry machines are designed for the type of cleaning required for protective clothing. Machines are available from Milnor, Model 30015C6M-AAC, for washing; or a Huabsch Originator, Model 3705H, for a dryer.

Note: The use of brand names is intended only to indicate a type of cleaning equipment. All products listed by name must be used in accordance with the manufacturer's recommendations. Use of a brand name does not constitute an endorsement nor does omission of a particular product brand imply that a product is inferior.



PPE Cleaning and Decontamination Decision-Making Process

Appendix B — Life safety ropes. (1) Life safety rope may be significantly weakened by abrasion, misuse, contamination, wear, and stresses approaching its breaking strength, particularly impact loading. Since there are no approved methods to service test a rope without compromising its strength, rope rescue and training operations should be carefully observed and monitored for conditions that could cause immediate failure or result in undetectable damage to the rope.

(2) If a rope has been used in a situation that could not be supervised or where potential damage may have occurred, it must be removed from service and destroyed.

(3) It is important that ropes be inspected for signs of wear by qualified individuals after each use. If indication of wear or damage are noted, or if the rope has been stressed in excess of the manufacturer's recommendation or impact loaded, it must be destroyed.

(4) The destruction of the rope means that it must be removed from service and altered in such a manner that it could not be mistakenly used as a life safety rope. This alteration could include disposing of the rope, or removal of identifying labels and attachments, and cutting the rope into short lengths that could be used for utility purposes.

(5) The assignment of "disposable" life safety ropes to members or to vehicles has proved to be an effective system to manage ropes that are provided for emergency use and are used infrequently. Special rescue teams, which train frequently and use large quantities of rope, should include members who are qualified to manage and evaluate the condition of their ropes and determine the limitations upon their reuse.

Appendix C — Decontamination. (1) A decontamination area should be established whenever civilians or fire department personnel have had known or suspected exposure to toxic chemicals.

(2) Such decontamination areas should be established before any personnel are allowed to enter the "Hot" zone.

(3) The decontamination area should be set up using the following guidelines:

(a) The decontamination area should be located uphill, upwind and at a right angle to the "Hot" zone.

(b) The decontamination area entry/exit point and boundaries should be clearly marked using flagging tape, ropes, cones, etc.

(3) Visqueene should be spread on the ground in the decontamination area to control runoff.

(4) The decontamination process is divided into stations. In most cases it will not be necessary to utilize all the stations. The decision to use all or part of the stations should be based on the following factors:

(a) The hazards associated with the product involved.

(b) The estimated levels of contamination.

(c) The type of protective equipment worn by contaminated responders.

(d) Recommendations from outside sources such as, but not limited to CHEMTREC, the agency for toxic substance and disease registry, poison control centers or the manufacturer of the product.

(5) The following is a list of all the stations in a nine-step decontamination area set up for a worst case scenario involv-

ing a hazardous materials response team member whose chemical suit has been breached:

(a) Station #1 - Segregated equipment drop: Contaminated equipment that will be used again in the "Hot" zone, disposed of, or decontaminated at a later time or place, will be deposited here.

(b) Station #2 - Wash/rinse: Entry personnel will be washed with appropriate decontamination solution and rinsed with water by attendant(s) to remove gross contamination. This station may consist of multiple wash/rinse steps depending on the severity of the hazards involved.

(c) Station #3 - Outer protective clothing removal: Attendant(s) will remove the outer protective clothing from entry personnel being cautious to avoid touching the inside of the suit while removing it. Protective clothing that has been removed at this step shall be placed in an overpack or other appropriate container for later testing and further decontamination, if needed.

(d) Station #4 - Removal of SCBA: The entry personnel are assisted in removing their SCBA by an attendant. The SCBA facepiece should be left in place and the low pressure hose held away from any potentially contaminated inner clothing.

(e) Station #5 - Removal of inner clothing: All clothing worn inside the suit must be removed in cases where the suit has been penetrated and the entry personnel are contaminated.

(f) Station #6 - Personal shower: Entry personnel should wash and rinse entire body with mild soap and water. Contain runoff water if possible, however this is an emergency situation and containment is secondary to removing contaminants from personnel.

(g) Station #7 - Drying off: Entry personnel that have showered should dry off using towels or whatever is available. Items used should be placed in an appropriate container for disposal. Emergency clothing such as disposable coveralls should be provided.

(h) Station #8 - Medical evaluation: Entry personnel should be evaluated by paramedics - checking vital signs including temperature and level of consciousness. Records of the evaluation must be kept and given to the team safety officer to be included in the members exposure records.

(i) Station #9 - Transport to emergency room: Any personnel exhibiting any signs or symptoms of exposure should be transported to the emergency room for evaluation and observation.

(6) The hazardous materials response team van should carry premeasured packets of decontamination solution mixes for the purpose of decontaminating chemical protective clothing and other equipment at the scene of a hazardous materials emergency. These solutions are not to be used to decontaminate turnouts or exposed skin under any circumstances.

(7) The primary solution used will be a simple detergent and water mixture. Other special decontamination solution mixes will only be used in those situations when it is determined that the detergent and water solution is inappropriate.

(8) Contaminated civilians that are exhibiting signs or symptoms of exposure should be treated as patients. Due to the risk of secondary contamination, all patients should undergo emergency field decontamination at the scene before

being evaluated by medical personnel or being transported to the emergency room. Medical personnel should not accept any patient that has not been grossly decontaminated.

(9) The emergency field decontamination process should consist of removing the clothing from all affected body parts of the exposed person and flushing with copious quantities of water from a garden hose or low pressure one and three-quarter inch handline to remove gross contamination. Patients will be flushed for up to fifteen minutes, depending on the material recommendations on patient decontamination.

(10) Members performing patient decontamination should wear, at a minimum, full turnouts and SCBA and should avoid splashes and overspray to the extent possible. They should also undergo decontamination when they have finished decontaminating the patient.

(11) Containment of the runoff water from patient decontamination is not required. Do not delay decontamination of patients to set up containment. However, some form of privacy screen should be erected to protect the modesty of those being decontaminated.

(12) Responders that are contaminated in the process of performing rescue or other tasks will, at the minimum, be flushed with water for a minimum of one minute. Further flushing will be performed depending on the extent of contamination and subsequent adverse health effects.

Appendix D—Wildland Fire Fighting Equipment Typings.

	PUMP RATE GPM MINIMUM	TANK CAPACITY IN GALLONS
PUMPER/BRUSH ENGINE:		
ICS Type 7	20	125
ICS Type 6	50	200
ICS Type 5	50	500
ICS Type 4	70	750
ICS Type 3	120	300
PUMPER/CLASS A RATED:		
ICS Type 2	500	400
ICS Type 1	1000	400

Ten standard fire orders

Fight fire aggressively but provide for safety first.

Initiate all action based on current and expected fire behavior.

Recognize current weather conditions and obtain forecasts.

Ensure instructions are given and understood.

Obtain current information on fire status.

Remain in communication with crew members, your supervisor, and adjoining forces.

Determine safety zones and escape routes.

Establish lookouts in potentially hazardous situations.

Retain control at all times.

Stay alert, keep calm, think clearly, act decisively.

Four common denominators of tragedy fires

1. Small fires or relatively quiet sectors of large fires.
2. Light fuels.
3. Steep slopes.
4. Change in wind speed and/or direction.

"Watch Out" Situations

1. Fire not scouted and sized up.
2. In country not seen in daylight.
3. Safety zones and escape routes not identified.
4. Unfamiliar with weather and local factors influencing fire behavior.
5. Uninformed on strategy, tactics and hazards.
6. Instructions and assignments not clear.
7. No communication link with crew members or supervisor.
8. Constructing line without safe anchor point.
9. Building fire line downhill with fire below.
10. Attempting frontal assault on fire.
11. Unburned fuel between you and fire.
12. Cannot see main fire, not in contact with someone who can.
13. On a hillside where rolling material can ignite fuel below.
14. Weather becoming hotter and drier.
15. Wind increases and/or changes direction.
16. Getting frequent spot fires across line.
17. Terrain and fuels make escape to safety zones difficult.
18. Taking nap near fire line.

National Wildlife Coordinating Group Fire Fighter II Performance Tasks

1. Agency policy for wildfires.
2. Extended attack fire orientation and dispatch.
3. Inmate orientation.
4. Fire line organization.
5. Tools and equipment.
6. Firing devices.
7. Wildland water delivery systems and pump use.
8. Introduction to wildland fire behavior.
9. Fire line safety.
10. Size up and initial attack.
11. Fire line construction.
12. Wildland fire investigation.
13. Structure protection.
14. Use of foam.
15. Mop up.
16. Compass use.
17. Map use.
18. Radio communications.
19. Incident command system.
20. Basic first aid.
21. Hazardous materials awareness.

Appendix E—Standard apparatus operation communications.

When fire fighters ride in the tiller's seat or other remote location, an electrical signal or voice communication should be installed between the tiller's seat, work station, and driver's compartment.

(1) These signals should be used between the driver and the fire fighters:

- (a) One long buzz means stop;
- (b) Two buzzes mean forward;
- (c) Three buzzes mean reverse.

(2) Before any of the above functions are undertaken, with the exception of stopping, the same signal must be both

sent and received. The driver should not act without sending and receiving a confirming signal.

(3) When using hand signals, these signals are as follows:

STOP

Hold hand to the side, shoulder high, exposing palm to the driver. At night, hold hands in the same manner, with the addition of a flashlight in one hand shining at the driver. This will indicate an immediate STOP.



STOP

Hold hand to the die, shoulder high, exposing palm to the driver. At night, hold hands in the same manner, with the addition of a flashlight in one hand shining at the driver. This will indicate an immediate STOP.

RIGHT OR LEFT

Point in the desired direction with one hand and motion in a circular "come-on" gesture with the other hand at the chest level. At night direct a flashlight beam at the hand pointing in the desired direction.



RIGHT OR LEFT

Point in the desired direction with one hand and motion in a circular "come-on" gesture with other at the chest level. At night, direct a flashlight beam at the hand pointing in the desired direction.

DIMINISHING CLEARANCE

Hold the hands to one side of the body indicating the approximate amount of distance the apparatus is from the obstacle. Close hands accordingly as the driver slowly maneuvers the apparatus to point where the signal indicates

immediate STOP. Always allow enough for drivers reaction time.

At night, indicate in the same manner with the flashlight in the upper hands and beam directed at the palm of the other. On STOP, cover the flashlight beam with the hands.



DIMINISHING CLEARANCE

Hold the hands to one side of the body indicating the approximate amount of distance the apparatus is from the obstacle. Close hands accordingly as the driver slowly maneuvers the apparatus to point where the signal indicates immediate STOP. Always allow enough for divers reaction time. At night, indicate in the same manner with the flashlight in the upper hands and beam directed at the palm of the other. On STOP, cover the flashlight beam with the hands.

AHEAD OR BACK-UP

Hold hand directly in front, chest high, fingers on hands directed toward one another, and motion in a circular "come-on" gesture. At night hold a flashlight in one hand and direct the beam toward the other.



AHEAD OR BACK UP

Hold hand directly in front, chest high, fingers on hands directed toward one another, and motion in circular "come-on" gesture. At night hold a flashlight in one hand and direct the beam toward the other.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-08000, filed 5/10/96, effective 1/1/97.]

Chapter 296-307 WAC

SAFETY STANDARDS FOR AGRICULTURE

WAC

FIELD OPERATIONS AND GENERAL REQUIREMENTS

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- 296-307-006 What does this chapter cover?
- 296-307-009 What definitions apply to this chapter?
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- 296-307-015 What must an employer do if a serious injury occurs?
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- 296-307-033 How often must safety meetings be held?
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- 296-307-03930 Make sure emergency washing facilities are functional and readily accessible.
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- 296-307-03940 Make sure supplemental flushing equipment provides sufficient water.
- 296-307-03945 Definitions.
- 296-307-045 What are the requirements of the safe place standard?

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- 296-307-08003 Which agricultural tractors are covered by this section?
- 296-307-08006 What definitions apply to rollover protective structures (ROPS) for agricultural tractors?
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- 296-307-08012 What requirements apply to seatbelts used with ROPS on agricultural tractors?
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- 296-307-11005 Definitions—Worker protection standards—40 CFR, § 170.3.
- 296-307-11010 General duties and prohibited actions—Worker protection standards—40 CFR, § 170.7.
- 296-307-11015 Violations of this part—Worker protection standards—40 CFR, § 170.9.

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- 296-307-120 Applicability of this section—Standards for workers—40 CFR, § 170.102.
- 296-307-12005 Exceptions—Standards for workers—40 CFR, § 170.103.
- 296-307-12010 Exemptions—Standards for workers—40 CFR, § 170.104.
- 296-307-12015 Restrictions associated with pesticide applications—Standards for workers—40 CFR, § 170.110.
- 296-307-12020 Entry restrictions—Standards for workers—40 CFR, § 170.112.
- 296-307-12025 Notice of applications—Standards for workers—40 CFR, § 170.120.
- 296-307-12030 Providing specific information about applications—Standards for workers—40 CFR, § 170.122.
- 296-307-12035 Notice of applications to handler employers—Standards for workers—40 CFR, § 170.124.
- 296-307-12040 Pesticide safety training—Standards for workers—40 CFR, § 170.130.
- 296-307-12045 Posted pesticide safety information—Standards for workers—40 CFR, § 170.135.
- 296-307-12050 Decontamination—Standards for workers—40 CFR, § 170.150.
- 296-307-12055 Emergency assistance—Standards for workers—40 CFR, § 170.160.

Standard for Pesticide Handlers

- 296-307-130 Applicability of this section—Standards for pesticide handlers—40 CFR, § 170.202.
- 296-307-13005 Exemptions—Standards for handlers—40 CFR, § 170.204.
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296-307-28026	What requirements apply to guarding cone-pulley belts?	296-307-32041	What requirements apply to lockout/tagout during shift changes?
296-307-28028	What requirements apply to guarding belt tighteners?	Part R	
296-307-28030	What requirements apply to guarding gears, sprockets, and chains?	Safety Color Coding; Accident Prevention Signs and Tags	
296-307-28032	What requirements apply to guarding friction drives?	296-307-330	Safety color coding; accident prevention signs and tags.
296-307-28034	What requirements apply to guarding keys, set screws, and other projections?	296-307-33001	What definitions apply to this section?
296-307-28036	What requirements apply to guarding collars and couplings?	296-307-33003	What does red identify in safety color coding?
296-307-28038	Must self-lubricating bearings be used?	296-307-33005	What does yellow identify in safety color coding?
296-307-28040	What requirements apply to guarding clutches, cutoff couplings, and clutch pulleys?		

296-307-33007	When should signs and tags use "danger" versus "caution"?	296-307-36627	Must the path to ground be continuous?
296-307-33009	What are the design and color specifications for accident prevention signs?	296-307-36630	What supports, enclosures, and equipment must be grounded?
296-307-33011	What are the proper uses of accident prevention tags?	296-307-36633	How must fixed equipment be grounded?
		296-307-36636	How must high voltage systems be grounded?
		296-307-368	Wiring methods, components, and equipment for general use.
	Part S		
	Fire Protection and Ignition Sources; Exit Routes		
296-307-340	Portable fire extinguishers.	296-307-36803	Does this section apply to factory-assembled equipment?
296-307-34003	What does this section cover?	296-307-36806	What wiring methods must be used for temporary wiring?
296-307-34006	Who is exempt from the requirements of this section?	296-307-36809	When may cable trays be used?
296-307-34009	What general requirements apply to portable fire extinguishers?	296-307-36812	What requirements apply to open wiring on insulators?
296-307-34012	How should portable fire extinguishers be selected and distributed?	296-307-36815	What wiring requirements apply to cabinets, boxes, and fittings?
296-307-34015	What are the requirements for inspection, maintenance and testing of portable fire extinguishers?	296-307-36818	What requirements apply to switches?
296-307-34018	What requirements apply to hydrostatic testing?	296-307-36821	Where must switchboards and panelboards be located?
296-307-34021	What are the training requirements for portable fire extinguishers?	296-307-36824	When must conductors be insulated?
296-307-345	Employee alarm systems.	296-307-36827	When may flexible cords and cables be used?
296-307-34503	What does this section cover?	296-307-36830	How must flexible cords and cables be identified, spliced, and terminated?
296-307-34506	What general requirements apply to employee alarm systems?	296-307-36833	What requirements apply to multiconductor portable cable?
296-307-34509	What are the installation and restoration requirements for employee alarm systems?	296-307-36836	When may fixture wires be used?
296-307-34512	How must employee alarm systems be maintained and tested?	296-307-36839	What requirements apply to wiring for lighting fixtures, lampholders, lamps, and receptacles?
296-307-34515	Where must manually operated devices be located?	296-307-36842	What requirements apply to wiring for receptacles, cord connectors, and attachment plugs (caps)?
296-307-350	Exit routes.	296-307-36845	What requirements apply to wiring for appliances?
296-307-35003	What does this section cover?	296-307-36848	What requirements apply to wiring for motors, motor circuits, and controllers?
296-307-35006	What definitions apply to this section?	296-307-36851	What requirements apply to wiring for transformers?
296-307-35009	What are the design requirements for exit routes?	296-307-36854	What requirements apply to wiring for capacitors?
296-307-35012	What are the operation and maintenance requirements for exit routes?	296-307-36857	How must storage batteries be ventilated?
296-307-35015	What are the requirements for an emergency action plan?	296-307-36860	What other miscellaneous requirements apply to wiring methods?
296-307-35018	What are the requirements for a fire prevention plan?	296-307-370	Special purpose equipment and installations.
		296-307-37003	What requirements apply to cranes, hoists, and runways?
	Part T		
	Electrical		
296-307-360	Electrical.	296-307-37006	What requirements apply to elevators, dumbwaiters, escalators, and moving walks?
296-307-36005	What does this part cover?	296-307-37009	What requirements apply to the disconnecting means for electric welders?
296-307-36010	What definitions apply to this part?	296-307-37012	What requirements apply to electrically driven or controlled irrigation machines?
296-307-362	General electrical requirements.	296-307-372	Hazardous (classified) locations.
296-307-36203	What electrical equipment must be approved?	296-307-37203	What does this section cover?
296-307-36206	How must electrical equipment safety be determined?	296-307-37206	What classifications apply to this section?
296-307-36209	What requirements apply to guarding live parts?	296-307-37209	What equipment, wiring methods, and installations may be used in hazardous locations?
296-307-36212	What workspace must be provided?	296-307-37212	How must conduit be installed in hazardous locations?
296-307-36215	What general requirements apply to splices?	296-307-37215	Which equipment may be used in Division 1 and 2 locations?
296-307-36218	What protection must be provided against combustible materials?	296-307-37218	What requirements apply to motors and generators used in hazardous locations?
296-307-36221	How must electrical equipment be marked?	296-307-374	Special systems.
296-307-36224	How must disconnecting means be marked?	296-307-37403	What requirements apply to systems over 600 volts, nominal?
296-307-36227	What access and working space must be provided for electrical equipment of 600 volts, nominal, or less?	296-307-37406	What requirements apply to emergency power systems?
296-307-36230	What access and working space must be provided for electrical equipment over 600 volts, nominal?	296-307-37409	How are Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits classified?
296-307-364	Electrical installation and maintenance.	296-307-37412	What requirements apply to fire protective signaling systems?
296-307-36403	How must flexible cords and cables be installed and maintained?	296-307-376	Working on or near exposed energized parts.
296-307-36406	How must attachment plugs and receptacles be installed and maintained?	296-307-37603	What does this section cover?
296-307-36409	What must employees do when equipment causes electrical shock?	296-307-37606	Who may work on energized parts?
296-307-36412	What grounding and bonding requirements apply to equipment installation and maintenance?	296-307-37609	What requirements apply to working near low voltage lines?
296-307-36415	What requirements apply to disconnecting means?	296-307-37612	What requirements apply to qualified persons working near overhead lines?
296-307-36418	What requirements apply to identification and load rating of electrical equipment?	296-307-37615	What requirements apply to vehicles and mechanical equipment near overhead lines?
296-307-36421	How must equipment be installed in wet locations?	296-307-37618	What lighting must be provided for employees working near exposed energized parts?
296-307-366	Wiring design and protection.	296-307-37621	What requirements apply to working near exposed energized parts in confined spaces?
296-307-36603	How must grounded and grounding conductors be used and identified?	296-307-37624	What housekeeping requirements apply to working near exposed energized parts?
296-307-36606	What ampere rating must outlet devices have?	296-307-37627	Who may defeat an electrical safety interlock?
296-307-36609	What requirements apply to conductors?	296-307-378	Safety-related work practices.
296-307-36612	What design and protection requirements apply to service-entrances?	296-307-37801	What does this section cover?
296-307-36615	What overcurrent protection must be provided?	296-307-37803	How must employees be trained on safety practices?
296-307-36618	What premises wiring systems must be grounded?	296-307-37805	How must safety-related work practices be chosen and used?
296-307-36621	Must the conductor be grounded for AC premises wiring?		
296-307-36624	What general requirements apply to grounding conductors?		

296-307-37807	What work practices must be followed for work on exposed deenergized parts?	296-307-41017	Where must containers be located?
296-307-37809	Must an employer have a written copy of lockout-tagout procedures?	296-307-41019	What requirements apply to valves and accessories?
296-307-37811	What work practices must be followed for deenergizing equipment?	296-307-41021	What requirements apply to piping, tubing, and fittings?
296-307-37813	How must locks and tags be applied?	296-307-41023	What specifications must hoses meet?
296-307-37815	What work practices must be followed to verify deenergization?	296-307-41025	What requirements apply to safety devices?
296-307-37817	What work practices must be followed when reenergizing equipment?	296-307-41027	How must indirect fired vaporizers be constructed and installed?
296-307-37819	What safety-related work practices relate to portable electric equipment?	296-307-41029	How must atmospheric vaporizers be constructed and installed?
296-307-37821	What safety-related work practices relate to electric power and lighting circuits?	296-307-41031	How must direct gas-fired vaporizers be constructed and installed?
296-307-37823	What safety-related work practices relate to test instruments and equipment?	296-307-41033	How must direct gas-fired tank heaters be constructed and installed?
296-307-37825	What safety-related work practices relate to flammable materials?	296-307-41035	How must dehydrators be constructed and installed?
296-307-380	Electrical protective equipment.	296-307-41037	What are the maximum filling densities?
296-307-38003	How must protective equipment be used?	296-307-41039	What requirements apply to LP-gas in buildings?
296-307-38006	What requirements apply to general protective equipment and tools?	296-307-41041	What requirements apply to transfer of liquids?
296-307-38009	What manufacturing and marking requirements apply to electrical protective devices?	296-307-41043	Must workers be trained?
296-307-38012	What electrical requirements apply to electrical protective devices?	296-307-41045	What fire protection must be provided for LP-gas installations?
296-307-38015	What workmanship and finish requirements apply to electrical protective devices?	296-307-41047	What electrical requirements apply to LP-gas installations?
296-307-38018	How must electrical protective devices be maintained and used?	296-307-41049	What requirements apply to liquid-level gauging devices?
	SPECIALIZED OPERATIONS	296-307-41051	What requirements apply to appliances?
	Part U-1	296-307-415	Cylinder systems.
	Hazardous Materials—Anhydrous Ammonia	296-307-41501	What does this section cover?
296-307-400	Anhydrous ammonia.	296-307-41503	What is a "cylinder system"?
296-307-40001	What does this section cover?	296-307-41505	How must containers be marked for cylinder systems?
296-307-40003	What definitions apply to this section?	296-307-41507	What additional requirements apply to cylinder systems installed outdoors?
296-307-40005	What general requirements apply to the storage and handling of anhydrous ammonia?	296-307-41509	What additional requirements apply to cylinder system installed indoors?
296-307-40007	What requirements apply to systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia?	296-307-41511	What requirements apply to valves and accessories?
296-307-40009	What requirements apply to systems mounted on farm wagons (implements of husbandry) for the application of ammonia?	296-307-41513	What requirements apply to safety devices for cylinder systems?
296-307-40011	What requirements must approved anhydrous ammonia equipment meet?	296-307-41515	What other requirements apply to cylinder systems?
296-307-40013	What requirements apply to the construction, original test, and requalification of nonrefrigerated containers?	296-307-420	Systems using non-DOT containers.
296-307-40015	How must nonrefrigerated containers and systems (other than DOT containers) be marked?	296-307-42001	What does this section cover?
296-307-40017	Where may anhydrous ammonia containers be located?	296-307-42003	How must non-DOT containers be designed and classified?
296-307-40019	What requirements apply to container accessories?	296-307-42005	What requirements apply to valves and accessories, filler pipes, and discharge pipes for non-DOT containers?
296-307-40021	What requirements apply to piping, tubing, and fittings?	296-307-42007	What additional requirements apply to safety devices for non-DOT containers?
296-307-40023	What specifications must hoses meet?	296-307-42009	When may non-DOT containers be reinstalled?
296-307-40025	What requirements apply to safety-relief devices?	296-307-42011	What is the maximum capacity allowed for non-DOT containers?
296-307-40027	What emergency precautions are required when handling anhydrous ammonia?	296-307-42013	How must non-DOT containers be installed?
296-307-40029	What requirements apply to filling densities?	296-307-42015	How must non-DOT containers be protected?
296-307-40031	What requirements apply to the transfer of liquids?	296-307-42017	What requirements apply to non-DOT containers in industrial plants?
296-307-40033	What requirements apply to tank car unloading points and operations?	296-307-42019	What requirements apply to container-charging plants?
296-307-40035	What requirements apply to the liquid-level gauging device?	296-307-42021	What fire protection must be provided for non-DOT containers?
296-307-40037	How should aboveground uninsulated containers be maintained?	296-307-42023	What other requirements apply to non-DOT containers?
296-307-40039	What requirements apply to electrical equipment and wiring?	296-307-425	LP-gas as a motor fuel.
	Part U-2	296-307-42501	What does this section cover?
	Hazardous Materials—Liquefied Petroleum Gas	296-307-42503	What general requirements apply to LP-gas used as a motor fuel?
296-307-410	Storage and handling of liquefied petroleum gases.	296-307-42505	How must fuel containers be designed and classified?
296-307-41001	What does this part cover?	296-307-42507	How must fuel containers be installed?
296-307-41003	Which LP-gas installations are not covered by this part?	296-307-42509	What requirements apply to valves and accessories?
296-307-41005	What definitions apply to this part?	296-307-42511	What requirements apply to piping, tubing, and fittings?
296-307-41007	When must LP-gas be odorized?	296-307-42513	What requirements apply to safety devices?
296-307-41009	Must LP-gas containers and equipment be approved?	296-307-42515	What requirements apply to vaporizers?
296-307-41011	What construction and test requirements must containers meet?	296-307-42517	What requirements apply to gas regulating and mixing equipment?
296-307-41013	How must containers be welded?	296-307-42519	What is the maximum container capacity allowed?
296-307-41015	How must containers be marked?	296-307-42521	What requirements apply to stationary engines used indoors?
		296-307-42523	What requirements apply to portable engines used indoors?
		296-307-42525	What requirements apply to industrial trucks used indoors?
		296-307-42527	How must LP-gas-fueled vehicles be garaged?
		296-307-430	Storage of containers awaiting use or resale.
		296-307-43001	What does this section cover?
		296-307-43003	What general requirements apply to storage of containers?
		296-307-43005	How must containers be stored within buildings frequented by the public?

296-307-43007	How must containers be stored in buildings not frequented by the public?		Construction
296-307-43009	How must containers be stored within special buildings or rooms?	296-307-45505	Include additional safeguards when constructing dip tanks.
296-307-43011	How must containers be stored outdoors?	296-307-45510	Provide overflow pipes.
296-307-43013	What fire protection must be provided for stored containers?	296-307-45515	Provide bottom drains.
			Fire Protection
296-307-435	LP-gas system installations on commercial vehicles.		
296-307-43501	What does this section cover?	296-307-45520	Provide fire protection in the vapor area.
296-307-43503	How must containers be constructed?	296-307-45525	Provide additional fire protection for large dip tanks.
296-307-43505	What is the maximum capacity allowed for LP-gas installations on commercial vehicles?		Electrical Wiring and Equipment and Sources of Ignition
296-307-43507	Where must systems be located?	296-307-45535	Prevent static electricity sparks or arcs when adding liquids to a dip tank.
296-307-43509	What requirements apply to valves and accessories?	296-307-45540	Control ignition sources.
296-307-43511	What requirements apply to safety devices?	296-307-45545	Provide safe electrical wiring and equipment where the liquid can drip or splash.
296-307-43513	What types of systems may be used on commercial vehicles?		Housekeeping
296-307-43515	What requirements apply to enclosures and mounting?		
296-307-43517	What requirements apply to piping, tubing, and fittings?	296-307-45550	Keep the area around dip tanks clear of combustible material and properly dispose of waste.
296-307-43519	What requirements apply to appliances?		Heating Liquid
296-307-43521	What general precautions must be followed for LP-gas system installations on commercial vehicles?		
296-307-43523	How must containers be charged?	296-307-45555	Make sure heating the liquid in your dip tanks does not cause a fire.
296-307-43525	What fire protection must be provided for mobile cook units?		Heat Drying
296-307-440	LP-gas service stations.		
296-307-44001	What does this section cover?	296-307-45560	Make sure a heating system used for drying objects does not cause a fire.
296-307-44003	How must storage containers be designed and classified?		Conveyors
296-307-44005	What requirements apply to valves and accessories?	296-307-45565	Make sure conveyor systems are safe.
296-307-44007	What requirements apply to safety devices?	296-307-460	Additional requirements for dip tanks used for specific processes.
296-307-44009	What is the maximum capacity allowed for containers?		Hardening or Tempering
296-307-44011	How must storage containers be installed?	296-307-46005	Meet specific requirements if you use a hardening or tempering tank.
296-307-44013	What equipment must be protected against tampering?		Vapor Degreasing
296-307-44015	What requirements apply to the transport truck unloading point?	296-307-46025	Provide additional safeguards for vapor degreasing tanks.
296-307-44017	What requirements apply to piping, valves, and fittings?		Spray Cleaning or Degreasing
296-307-44019	What requirements apply to pumps and accessory equipment?	296-307-46030	Control liquid spray over an open surface cleaning or degreasing tank.
296-307-44021	What requirements apply to LP-gas dispensing devices?	296-307-465	Definitions.
296-307-44023	Is smoking allowed at LP-gas service stations?		Part V Welding
296-307-44025	What fire protection must be provided at LP-gas service stations?	296-307-475	Welding, cutting, and brazing.
	Part U-3	296-307-47501	What definitions apply to this part?
	Other Hazardous Materials	296-307-480	Installation and operation of oxygen fuel gas systems for welding and cutting.
	Dipping and Coating Operations (Dip Tanks)	296-307-48001	What general requirements apply to oxygen fuel gas systems?
296-307-445	Scope.	296-307-48003	What requirements apply to portable cylinders?
296-307-450	General requirements.	296-307-48005	What general requirements apply to storing compressed gas cylinders?
	Construction	296-307-48007	How must fuel-gas cylinders be stored?
296-307-45005	Construct safe dip tanks.	296-307-48009	How must oxygen cylinders be stored?
	Ventilation	296-307-48011	What general operating procedures apply to working with cylinders and containers?
296-307-45010	Provide proper ventilation for the vapor area.	296-307-48013	What requirements apply to safety devices on cylinders?
296-307-45015	Take additional precautions if you recirculate ventilation system exhaust air into the workplace.	296-307-48015	How must cylinders be transported?
296-307-45020	Take additional precautions when using an exhaust hood.	296-307-48017	How must cylinders be handled?
	Inspection	296-307-48019	What requirements apply to cylinder valves?
296-307-45025	Periodically inspect your dip tanks and associated equipment and correct any deficiencies.	296-307-48021	What requirements apply to cylinder regulators?
	First Aid	296-307-48023	What requirements apply to fuel-gas manifolds?
296-307-45030	Make sure employees working near dip tanks know appropriate first-aid procedures.	296-307-48025	What requirements apply to high pressure oxygen manifolds?
	Cleaning	296-307-48027	What requirements apply to low pressure oxygen manifolds?
296-307-45035	Prepare dip tanks before cleaning.	296-307-48029	What requirements apply to manifolding portable outlet headers?
	Welding	296-307-48031	What operating procedures apply to cylinder manifolds?
296-307-45045	Protect employees during welding, burning, or other work using open flames.	296-307-48033	How must service piping systems be designed?
	Liquids Harmful to Skin	296-307-48035	What requirements apply to piping joints?
296-307-45050	Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.	296-307-48037	How must service piping systems be installed?
296-307-455	Additional requirements for dip tanks using flammable or combustible liquids.	296-307-48039	How must service piping systems be painted and marked?
		296-307-48041	How must service piping systems be tested?

296-307-48043	How must equipment be installed?	296-307-52030	Is there any additional (nonmandatory) information that may assist me with powered industrial truck operator training?
296-307-48045	How must service piping systems be protected?	296-307-52031	What requirements apply to operating powered industrial trucks?
296-307-48047	What requirements apply to piping protective equipment?	296-307-52033	When may trucks be used to open or close freight car doors?
296-307-48049	What requirements apply to station outlet protective equipment?	296-307-52035	What requirements apply to lifting employees on the forks of trucks?
296-307-48051	What requirements apply to hose and hose connections?	296-307-52037	What requirements apply to using platforms for hoisting employees?
296-307-48053	What requirements apply to pressure-reducing regulators?	296-307-52039	What requirements apply to traveling in a powered industrial truck?
296-307-485	Installation and operation of resistance welding equipment.	296-307-52041	What requirements apply to traveling speeds of powered industrial trucks?
296-307-48501	What general requirements apply to resistance welding equipment?	296-307-52043	What requirements apply to loading powered industrial trucks?
296-307-48503	What requirements apply to portable welding machines?	296-307-52045	What requirements apply to servicing powered industrial trucks?
296-307-48505	What requirements apply to flash welding equipment?	296-307-52047	What requirements apply to maintaining powered industrial trucks?
296-307-48507	Who must perform a job hazard analysis?		
296-307-48509	What maintenance requirements apply to resistance welding equipment?		
296-307-490	Application, installation, and operation of arc welding and cutting equipment.		
296-307-49001	What environmental conditions must be taken into account when selecting arc welding equipment?		
296-307-49003	What voltages must arc welding equipment use?		
296-307-49005	How must arc welding equipment be designed?		
296-307-49007	How must arc welding equipment be installed?	296-307-530	Rim wheel servicing.
296-307-49009	How must arc welding equipment be grounded?	296-307-53001	What does this section cover?
296-307-49011	What requirements apply to supply connections and conductors?	296-307-53003	What definitions apply to rim wheel servicing?
296-307-49013	How must arc welding equipment be operated?	296-307-53005	What training must an employer provide for employees who service rim wheels?
296-307-49015	How must arc welding equipment be maintained?	296-307-53007	What requirements apply to restraining devices?
296-307-495	Fire prevention and protection.	296-307-53009	What other equipment must an employer provide for rim wheel servicing?
296-307-49501	What basic fire prevention precautions must be taken?	296-307-53011	What requirements apply to wheel component assembly?
296-307-49503	What special fire prevention precautions must be taken?	296-307-53013	What are the safe operating procedures for servicing multipiece rim wheels?
296-307-49505	What precautions must be taken when welding or cutting containers?	296-307-53015	What are the safe operating procedures for servicing single-piece rim wheels?
296-307-49507	What precautions must be taken when welding in confined spaces?	296-307-53017	How can an employer order the OSHA charts?
296-307-500	Protection of employees.		
296-307-50001	How must eye protection be selected?		
296-307-50003	What specifications must eye protection meet?		
296-307-50005	What protective clothing must welders wear?		
296-307-50007	What other requirements apply to employee protection?		
296-307-50009	What employee protection must be provided in confined spaces?		
296-307-50011	What general requirements apply to welding ventilation?		
296-307-50013	What ventilation must be provided for general welding and cutting?		
296-307-50015	What requirements apply to local exhaust hoods and booths?		
296-307-50017	What ventilation must be provided in confined spaces?		
296-307-50019	What requirements apply to welding fluorine compounds?		
296-307-50021	What requirements apply to welding zinc?		
296-307-50023	What requirements apply to welding lead?		
296-307-50025	What requirements apply to welding beryllium?		
296-307-50027	What requirements apply to welding cadmium?		
296-307-50029	What requirements apply to welding mercury?		
	Part W		
	Powered Industrial Trucks (Forklifts)		
296-307-520	Powered industrial trucks (forklifts).	296-307-52030	Is there any additional (nonmandatory) information that may assist me with powered industrial truck operator training?
296-307-52001	What does this section cover?	296-307-52031	What requirements apply to operating powered industrial trucks?
296-307-52003	What is a "powered industrial truck"?	296-307-52033	When may trucks be used to open or close freight car doors?
296-307-52005	What manufacturer's requirements apply to powered industrial trucks?	296-307-52035	What requirements apply to lifting employees on the forks of trucks?
296-307-52007	What are the classifications of powered industrial trucks?	296-307-52037	What requirements apply to using platforms for hoisting employees?
296-307-52009	What must a user consider before choosing a powered industrial truck?	296-307-52039	What requirements apply to traveling in a powered industrial truck?
296-307-52011	What requirements determine which trucks to use in specific hazardous environments?	296-307-52041	What requirements apply to traveling speeds of powered industrial trucks?
296-307-52013	In what environments may converted trucks be used?	296-307-52043	What requirements apply to loading powered industrial trucks?
296-307-52015	What requirements apply to overhead safety guards?	296-307-52045	What requirements apply to servicing powered industrial trucks?
296-307-52017	What requirements apply to load backrests?	296-307-52047	What requirements apply to maintaining powered industrial trucks?
296-307-52019	What requirements apply to fuel handling and storage?		
296-307-52021	What requirements apply to lighting for operating areas?		
296-307-52023	What level of carbon monoxide gas is allowed?		
296-307-52025	What requirements apply to dockboards (bridge plates)?		
296-307-52027	What rules apply to loading trucks, trailers, and railroad cars with powered industrial trucks?		
296-307-52029	What are the operator training requirements for powered industrial trucks?		
			Part X
			Rim Wheel Servicing
			Rim wheel servicing.
			What does this section cover?
			What definitions apply to rim wheel servicing?
			What training must an employer provide for employees who service rim wheels?
			What requirements apply to restraining devices?
			What other equipment must an employer provide for rim wheel servicing?
			What requirements apply to wheel component assembly?
			What are the safe operating procedures for servicing multipiece rim wheels?
			What are the safe operating procedures for servicing single-piece rim wheels?
			How can an employer order the OSHA charts?
			Part Y
			Occupational Health Standards
			Part Y-1
			Employer Chemical Hazard Communication
			Employer chemical hazard communication—Introduction.
			Develop, implement, maintain, and make available a written Chemical Hazard Communication Program.
			Identify and list all the hazardous chemicals present in your workplace.
			Obtain and maintain material safety data sheets (MSDSs) for each hazardous chemical used.
			Make sure material safety data sheets are readily accessible to your employees.
			Label containers holding hazardous chemicals.
			Inform and train your employees about hazardous chemicals in your workplace.
			Follow these rules for laboratories using hazardous chemicals.
			Follow these rules for handling chemicals in factory-sealed containers.
			Translate certain chemical hazard communication documents upon request.
			Attempt to obtain a material safety data sheet (MSDS) upon request.
			Items or chemicals exempt from the rule, and exemptions from labeling.
			Definitions.
			Part Y-2
			Material Safety Data Sheets and Label Preparation
			Scope.
			Hazard evaluation.
			Conduct complete hazard evaluations.
			Provide access to hazard evaluation procedures.
			Material safety data sheets.
			Develop or obtain material safety data sheets (MSDSs).
			Provide MSDSs for products shipped, transferred or sold over-the-counter.
			Follow-up if an MSDS is not provided.
			Labeling.
			Label containers of hazardous chemicals.
			Definitions.

296-307-570	Lighting rule.	296-307-63210	Control employee noise exposures that equal or exceed 90 dBA TWA <sub>8</sub> .
296-307-57005	Provide and maintain adequate lighting.	296-307-63215	Make sure employees use hearing protection when their noise exposure equals or exceeds 85 dBA TWA <sub>8</sub> .
296-307-590	Environmental tobacco smoke in the office—Summary.	296-307-63220	Make sure exposed employees receive training about noise and hearing protection.
296-307-59005	Prohibit tobacco smoke in your office work environment.	296-307-63225	Make sure warning signs are posted for areas where noise levels equal or exceed 115 dBA.
	Part Y-3	296-307-63230	Arrange for oversight of audiometric testing.
	Lighting	296-307-63235	Identify and correct deficiencies in your hearing loss prevention program.
	Part Y-4	296-307-63240	Document your hearing loss prevention activities.
	Environmental Tobacco Smoke in the Office		Noise Measurement and Computation
	Part Y-5	296-307-634	Summary.
	Respirators	296-307-63405	Make sure that noise-measuring equipment meets recognized standards.
296-307-594	Scope.	296-307-63410	Measure employee noise exposure.
296-307-596	Respirator program administrator.	296-307-63415	Use these equations when estimating full-day noise exposure from sound level measurements.
296-307-59605	Designate a program administrator.		Audiometric Testing
296-307-598	Voluntary respirator use requirements.	296-307-636	Summary.
296-307-59805	Make sure voluntary use of respirators is safe.	296-307-63605	Provide audiometric testing at no cost to employees.
296-307-59810	Keep voluntary use program records.	296-307-63610	Establish a baseline audiogram for each exposed employee.
296-307-600	Written respirator program and recordkeeping.	296-307-63615	Conduct annual audiograms.
296-307-60005	Develop and maintain a written program.	296-307-63620	Review audiograms that indicate a standard threshold shift.
296-307-60010	Keep respirator program records.	296-307-63625	Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.
296-307-602	Respirator selection.	296-307-63630	Make sure a record is kept of audiometric tests.
296-307-60205	Select and provide appropriate respirators.	296-307-63635	Make sure audiometric testing equipment meets these requirements.
296-307-604	Medical evaluations.		Options to Audiometric Testing
296-307-60405	Provide medical evaluations.	296-307-638	Summary.
296-307-606	Fit testing.	296-307-63805	Conduct hearing protection audits at least quarterly.
296-307-60605	Conduct fit testing.	296-307-63810	Make sure staff conducting audits are properly trained.
296-307-608	Training.	296-307-63815	Assess the hearing protection used by each employee during audits.
296-307-60805	Provide effective training.	296-307-63820	Document your hearing protection audits.
296-307-610	Maintenance.		Third-party Audiometric Tests
296-307-61005	Maintain respirators in a clean and reliable condition.	296-307-63825	Make sure third-party hearing loss prevention programs meet the following requirements.
296-307-61010	Store respirators properly.	296-307-640	Noise definitions.
296-307-61015	Inspect and repair respirators.		Part Y-8
296-307-612	Safe use and removal of respirators.	296-307-642	Scope.
296-307-61205	Prevent sealing problems with tight-fitting respirators.	296-307-644	Summary.
296-307-61210	Make sure employees leave the use area before removing respirators.	296-307-64402	Identify permit-required confined spaces.
		296-307-64404	Inform employees and control entry to permit-required confined spaces.
296-307-614	Standby requirements for immediately dangerous to life or health (IDLH) conditions.	296-307-64406	Follow these requirements when you contract with another employer to enter your confined space.
296-307-61405	Provide standby assistance in immediately dangerous to life or health (IDLH) conditions.		Permit-required Confined Space Program
296-307-616	Air quality for self-contained breathing apparatus (SCBA) and air-line respirators.	296-307-646	Summary.
296-307-61605	Make sure breathing air and oxygen meet established specifications.	296-307-64602	Develop a written permit-required confined space program.
296-307-61610	Prevent conditions that could create a hazardous breathing air supply.	296-307-64604	Meet these additional requirements if your employees enter another employer's confined space.
296-307-61615	Make sure compressors do not create a hazardous breathing air supply.		Employee Training
296-307-618	Labeling of air-purifying respirator filters, cartridges, and canisters.	296-307-648	Summary.
296-307-61805	Keep labels readable on respirator filters, cartridges, and canisters during use.	296-307-64802	Provide employee training.
296-307-620	Required procedures for respiratory protection program.	296-307-64804	Certify employee proficiency.
296-307-62005	Use this medical questionnaire for medical evaluations.		Permit Entry Procedures
296-307-62010	Follow these fit-testing procedures for tight-fitting respirators.	296-307-650	Summary.
296-307-62015	Follow procedures established for cleaning and disinfecting respirators.	296-307-65002	Implement procedures for entry permits.
296-307-62020	Follow procedures established for seal checking respirators.	296-307-65004	Use an entry permit that contains all required information.
296-307-622	Definitions.	296-307-65006	Keep and review your entry permits.
	Part Y-6	296-307-65008	Prevent unauthorized entry.
	Respiratory Hazards	296-307-65010	Provide, maintain, and use proper equipment.
296-307-624	Scope.	296-307-65012	Evaluate and control hazards for safe entry.
296-307-626	Evaluate and control employee exposures.	296-307-65014	Make sure you have adequate rescue and emergency services available.
296-307-62605	Identify and evaluate respiratory hazards.		
296-307-62610	Control employee exposures.		
296-307-62615	Use respirators.		
296-307-62620	Notify employees.		
296-307-62625	Permissible exposure limits of air contaminants.		
296-307-628	Definitions.		
	Part Y-7		
	Hearing Loss Prevention (Noise)		
296-307-630	Scope.		
	Hearing Loss Prevention Program		
296-307-632	Summary.		
296-307-63205	Conduct employee noise exposure monitoring.		

296-307-65016	Use nonentry rescue systems or methods whenever possible.		
296-307-65018	Make sure entry supervisors perform their responsibilities and duties.		
296-307-65020	Provide an attendant outside the permit-required confined space.		
296-307-65022	Make sure entrants know the hazardous conditions and their duties.		
296-307-65024	Implement procedures for ending entry.		
296-307-652	Alternate entry procedures.		
296-307-65202	Make sure the following conditions are met if using alternate entry procedures.		
296-307-65204	Follow these alternate entry procedures for permit-required confined spaces.	296-307-16001	What requirements apply to camp sites? [Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-16001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16001, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-654	Nonpermit confined spaces requirements.		
296-307-65402	Follow these requirements when classifying a confined space as a nonpermit confined space.	296-307-16003	How must camp shelters be constructed? [Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-16003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-08-051A, § 296-306A-16003, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-16003, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-65404	Reevaluate nonpermit confined spaces if hazards develop.		
296-307-656	Definitions.		

Part Y-10  
Emergency Response

296-307-704	Scope.		
296-307-70410	Planning.	296-307-16004	What electricity must be provided for temporary labor camps? [Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16004, filed 12/1/98, effective 3/1/99.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-70415	Training.		
296-307-70420	Medical surveillance.		
296-307-70425	Keep records.		
296-307-70430	Incident requirements.		
296-307-70435	Implement and maintain an incident command system (ICS).	296-307-16005	What requirements apply to the water supply? [97-09-013, recodified as § 296-307-16005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16005, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-70440	Prepare skilled support personnel.		
296-307-70445	Make sure the incident commander oversees activities during the response.		
296-307-70450	Use the buddy system in danger areas.		
296-307-70455	Provide rescue and medical assistance.		
296-307-70460	Personal protective equipment.		
296-307-70465	Control hazards created by personal protective equipment (PPE).	296-307-16007	Must an employer provide toilet facilities for the camp? [97-09-013, recodified as § 296-307-16007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16007, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-70470	Use personal protective equipment (PPE) properly.		
296-307-70475	Postemergency response.		
296-307-70480	Definitions.		

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

296-307-03910	Make sure first-aid training contains required subjects. [Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050. 01-17-033, § 296-307-03910, filed 8/8/01, effective 9/1/01.] Repealed by 04-07-160, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060.	296-307-16009	Must sewer lines connect to public sewers? [97-09-013, recodified as § 296-307-16009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16009, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-03915	Document your first-aid training. [Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050. 01-17-033, § 296-307-03915, filed 8/8/01, effective 9/1/01.] Repealed by 04-07-160, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060.	296-307-16011	What facilities must an employer provide for laundry, handwashing, and bathing? [97-09-013, recodified as § 296-307-16011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16011, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-03925	Provide a first-aid station when required. [Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050. 01-17-033, § 296-307-03925, filed 8/8/01, effective 9/1/01.] Repealed by 04-07-160, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060.	296-307-16013	What lighting must an employer provide in camp buildings? [Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16013, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-16013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-08-051A, § 296-306A-16013, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-16013, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-042	Must an employer provide first-aid kits? [97-09-013, recodified as § 296-307-042, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-042, filed 10/31/96, effective 12/1/96.] Repealed by 01-17-033, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050.		
296-307-14520	What are the department's recommendations for cholinesterase monitoring? (Nonmandatory) [97-09-013, recodified as § 296-307-14520, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-14520, filed 10/31/96, effective 12/1/96.] Repealed by 03-24-105, filed 12/3/03, effective 2/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060.	296-307-16015	What requirements apply to refuse disposal? [97-09-013, recodified as § 296-307-16015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16015, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
296-307-160	Temporary labor camps. [97-09-013, recodified as § 296-307-160, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-160, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.	296-307-16017	What cooking and food-handling facilities must be provided in temporary labor camps? [Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16017, filed

- 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-16017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16017, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
- 296-307-16019 Must an employer provide insect and rodent control? [97-09-013, recodified as § 296-307-16019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16019, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
- 296-307-16021 What first-aid facilities must be available in the camp? [97-09-013, recodified as § 296-307-16021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16021, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
- 296-307-16023 When must an employer report communicable diseases in a camp? [97-09-013, recodified as § 296-307-16023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16023, filed 10/31/96, effective 12/1/96.] Repealed by 00-06-081, filed 3/1/00, effective 3/1/00. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374.
- 296-307-28008 What training must an employer provide for employees who use agricultural equipment? [97-09-013, recodified as § 296-307-28008, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28008, filed 10/31/96, effective 12/1/96.] Repealed by 98-24-096, filed 12/1/98, effective 3/1/99. Statutory Authority: RCW 49.17.040.
- 296-307-28010 What requirements apply to machine controls? [97-09-013, recodified as § 296-307-28010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28010, filed 10/31/96, effective 12/1/96.] Repealed by 98-24-096, filed 12/1/98, effective 3/1/99. Statutory Authority: RCW 49.17.040.
- 296-307-28012 What requirements apply to guarding steam pipes? [97-09-013, recodified as § 296-307-28012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28012, filed 10/31/96, effective 12/1/96.] Repealed by 98-24-096, filed 12/1/98, effective 3/1/99. Statutory Authority: RCW 49.17.040.
- 296-307-45001 What general requirements apply to hazardous materials and flammable and combustible liquids? [Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-45001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45001, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45003 What requirements apply to dip tanks containing flammable or combustible liquids? [Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-45003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45003, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45007 What requirements must ventilation systems meet? [97-09-013, recodified as § 296-307-45007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45007, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45009 What general requirements apply to the construction of dip tanks? [Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-45009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45009, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45011 How must overflow pipes for dip tanks be constructed? [97-09-013, recodified as § 296-307-45011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45011, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45013 How must the bottom drains of dip tanks be constructed? [97-09-013, recodified as § 296-307-45013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45013, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45017 What measures must an employer take to prevent hazards from electrical and other ignition sources? [Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45017, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-45017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45017, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45019 How must dip tanks be operated and maintained? [97-09-013, recodified as § 296-307-45019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45019, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45021 What requirements must fire extinguishing systems meet? [Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45021, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-45021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45021, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45023 What requirements apply to hardening and tempering tanks? [Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45023, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-45023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45023, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45027 What requirements apply to electrostatic apparatus? [Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45027, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-45027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45027, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.

- 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-45029 What requirements apply to roll coating applications? [97-09-013, recodified as § 296-307-45029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-45029, filed 10/31/96, effective 12/1/96.] Repealed by 03-10-068, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-307-445 through 296-307-465.
- 296-307-452 Scope. [Statutory Authority: RCW 49.17.010, [49.17].-040, and [49.17].050. 02-11-141, § 296-307-452, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45210 Planning. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45210, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45220 Training. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45220, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45230 Medical surveillance. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45230, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45240 Keep records. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45240, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45400 Incident requirements. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45400, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45410 Implement and maintain an incident command system (ICS). [Statutory Authority: RCW 49.17.010, [49.17].-040, and [49.17].050. 02-11-141, § 296-307-45410, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45420 Prepare skilled support personnel. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45420, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45430 Make sure the incident commander oversees activities during the response. [Statutory Authority: RCW 49.17.-010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45430, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45440 Use the buddy system in danger areas. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].-050. 02-11-141, § 296-307-45440, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45450 Provide rescue and medical assistance. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].-050. 02-11-141, § 296-307-45450, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45600 Personal protective equipment. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45600, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45610 Control hazards created by personal protective equipment (PPE). [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45610, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45620 Use personal protective equipment (PPE) properly. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45620, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-45800 Postemergency response. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-45800, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-46000 Definitions. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-307-46000, filed 5/22/02, effective 10/1/02.] Repealed by 05-01-166, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-307 WAC, Part Y-10.
- 296-307-59010 Control tobacco smoke that comes in from the outside. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-59010, filed 8/8/01, effective 9/1/01.] Repealed by 06-22-023, filed 10/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.

**FIELD OPERATIONS AND GENERAL REQUIREMENTS**

**Part A**

**General and Educational Requirements**

**WAC 296-307-003 How is this chapter divided?** The first three digits of the WAC (296) are the title. The second three digits are the chapter (307). The third number group is the section, which may have three or five digits. The fourth and fifth digits are treated as if there were a decimal point after the third digit.

For example: Section 330 of this chapter includes all five-digit sections whose number begins with 330.

Sections may be further divided as indicated below.

Title-Chapter-Section	296-307-330 296-307-33003
Subsection	(1) (2)
Subdivision	(a) (b)
Item	(i) (ii)

Note: The chapter is also divided into "parts" according to subject, to make it easier for you to find the information you need.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-003, filed 10/31/96, effective 12/1/96.]

### **WAC 296-307-006 What does this chapter cover? (1)**

Chapter 296-307 WAC applies to all agricultural operations with one or more employees covered by the Washington Industrial Safety and Health Act (WISHA), chapter 49.17 RCW.

"Agricultural operations" means farming and ranching, including, but not limited to:

- (a) Cultivating and tilling the soil;
- (b) Dairy farming;
- (c) Producing, cultivating, growing, and harvesting of any agricultural or horticultural commodity;
- (d) Raising livestock, bees, fur-bearing animals, or poultry; and
- (e) Any practices performed by a farmer or on a farm, incident to or in connection with such farming operations, including but not limited to preparation for market and delivery to:
  - (i) Storage;
  - (ii) Market; or
  - (iii) Carriers for transportation to market. Agricultural operations include, but are not limited to, all employers in one or more of the following standard industrial classification (SIC) codes:

- 0111 Wheat
- 0115 Corn
- 0119 Cash grains not elsewhere classified, barley, peas, lentils, oats, etc.
- 0133 Sugar cane and sugar beets
- 0134 Irish potatoes—all potatoes except yams
- 0139 Field crops—hay, hops, mint, etc.
- 0161 Vegetables and melons, all inclusive
- 0171 All berry crops
- 0172 Grapes
- 0173 Tree nuts
- 0175 Deciduous tree fruits
- 0179 Tree fruits or tree nuts not elsewhere classified
- 0181 Ornamental floriculture and nursery products
- 0182 Food crops grown under cover
- 0191 General farms, primarily crops
- 0211 Beef cattle feedlots
- 0212 Beef cattle except feedlots—cattle ranches
- 0213 Hogs
- 0214 Sheep and goats
- 0219 General livestock except dairy and poultry
- 0241 Dairy farms
- 0251 Broiler, fryer, and roaster chickens
- 0252 Chicken eggs
- 0253 Turkeys and turkey eggs
- 0254 Poultry hatcheries
- 0259 Poultry and eggs not elsewhere classified
- 0271 Fur bearing animals and rabbits
- 0272 Horses

- 0273 Animal aquaculture
- 0279 Animal specialties not elsewhere classified
- 0291 General farms, primarily livestock and animal specialties
- 0711 Soil preparation services
- 0721 Crop planting, cultivating, and protecting
- 0722 Crop harvesting, primarily by machine
- 0751 Livestock services, except veterinary
- 0761 Farm labor contractors
- 0811 Timber tracts, Christmas tree growing, tree farms
- 0831 Forest nurseries
- 0851 Forestry services—reforestation

"Agricultural operations" do not include a farmer's processing for sale or handling for sale a commodity or product grown or produced by a person other than the farmer or the farmer's employees.

(2) Chapter 296-24 WAC does not apply to agricultural operations.

(3) All agricultural operations are also covered by the requirements of chapter 296-62 WAC, general occupational health rules.

(4) Occasionally, employees engaged in agricultural operations may also be covered by the safety standards of other industries. Following are excerpts from four industry standards that may help you determine if these other standards also apply:

### **Chapter 296-54 WAC Safety standards—Logging operations**

#### **WAC 296-54-501 Scope and application.**

This standard establishes safety practices, means, methods and operations for all types of logging, regardless of the end use of the wood. These types of activities include, but are not limited to, pulpwood and timber harvesting and the logging of sawlogs, veneer bolts, poles, pilings and other forest products. The requirements herein contained do not apply to log handling at sawmills, plywood mills, pulp mills or other manufacturing operations governed by their own specific safety standards.

### **Chapter 296-99 WAC Safety standards for grain handling facilities**

#### **WAC 296-99-015 What grain-handling operations does this chapter cover?**

(1) WAC 296-99-010 through 296-99-070 apply to:

- Dry grinding operations of soycake;
- Dry corn mills;
- Dust pelletizing plants;
- Feed mills;
- Flour mills;
- Flat storage structures;
- Grain elevators;
- Rice mills; and
- Soybean flaking operations.

(2) WAC 296-99-075, 296-99-080, and 296-99-085 apply only to grain elevators.

(3) Chapter 296-99 WAC does not apply to alfalfa storage or processing operations if they do not use grain products.

## Chapter 296-78 WAC Safety standards for sawmills and woodworking operations

### WAC 296-78-500 Foreword.

The chapter 296-78 WAC shall apply to and include safety requirements for all installations where the primary manufacturing of wood building products takes place. The installations may be a permanent fixed establishment or a portable operation. These operations shall include but are not limited to log and lumber handling, sawing, trimming and planing, plywood or veneer manufacturing, canting operations, waste or residual handling, operation of dry kilns, finishing, shipping, storage, yard and yard equipment, and for power tools and affiliated equipment used in connection with such operation. WAC 296-78-450 shall apply to shake and shingle manufacturing. The provisions of WAC 296-78-500 through 296-78-84011 are also applicable in shake and shingle manufacturing except in instances of conflict with the requirements of WAC 296-78-705.

## Chapter 296-155 WAC Safety standards for construction work

### WAC 296-155-005 Purpose and scope.

The standards included in this chapter apply throughout the state of Washington, to any and all work places subject to the Washington Industrial Safety and Health Act (chapter 49.17 RCW), where construction, alteration, demolition, related inspection, and/or maintenance and repair work, including painting and decorating, is performed. These standards are minimum safety requirements with which all industries must comply when engaged in the above listed types of work.

(5) If rules in this chapter conflict with rules in another chapter of Title 296 WAC, this chapter prevails.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-006, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-009 What definitions apply to this chapter? "Approved"** means approved by the director of the department of labor and industries, or by another organization designated by the department. Also means listed or approved by a nationally recognized testing laboratory.

**"Authorized person"** means someone you have approved to perform specific duties or to be at a specific location on the job site.

**"Biological agents"** means organisms or their by-products.

**"Chemical agents (airborne or contact)"** means a chemical agent is any of the following:

- Airborne chemical agent which is any of the following:
  - Dust - solid particles suspended in air, generated by handling, drilling, crushing, grinding, rapid impact, detonation, or decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, grain, etc.
  - Fume - solid particles suspended in air, generated by condensation from the gaseous state, generally after volatilization from molten metals, etc., and often accompanied by a chemical reaction such as oxidation.

- Gas - a normally formless fluid that can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.

- Mist - liquid droplets suspended in air, generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming or atomizing.

- Vapor - the gaseous form of a substance that is normally in the solid or liquid state.

- Contact chemical agent which is any of the following:

- Corrosives - substances that in contact with living tissue cause destruction of the tissue by chemical action.

- Irritants - substances that on immediate, prolonged, or repeated contact with normal living tissue will induce a local inflammatory reaction.

- Toxicants - substances that have the inherent capacity to produce personal injury or illness to individuals by absorption through any body surface.

**"Department"** means the department of labor and industries. When this chapter refers to "we" or "us," it means labor and industries staff responsible for enforcing the Washington Industrial Safety and Health Act (WISHA).

**"Director"** means the director of the department of labor and industries, or a designated representative.

**"Employee"** means someone providing personal labor in the business of the employer, including anyone providing personal labor under an independent contract.

**"Employer"** means a business entity having one or more employees. Also, any person, partnership, or business entity with no employees but having industrial insurance coverage is both an employer and an employee. When this chapter refers to "you," it means the employer or a designated representative.

**"Hazard"** means a condition that can cause injury, death, or occupational disease.

**"Listed"** means listed by a nationally recognized testing laboratory.

**"Must"** means mandatory.

**"Nationally recognized testing laboratory"** See 29 CFR 1910.7 (federal OSHA requirements).

**"Pesticide"** means:

- Any substance intended to prevent, destroy, control, repel, or mitigate any insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus on or in a living person or other animal which is normally considered to be a pest or which the director may declare to be a pest;

- Any substance or mixture of substances intended to be used as a plant regulator, defoliant or desiccant; and

- Any spray adjuvant, such as a wetting agent, spreading agent, deposit builder, adhesive, emulsifying agent, deflocculating agent, water modifier, or similar agent with or without toxic properties of its own, intended to be used with any pesticide as an aid to its application or effect, and sold in a package or container separate from that of the pesticide with which it is to be used.

**"Safety factor"** means the ratio of the ultimate breaking strength of a piece of material or equipment to the actual working stress or safe load when in use.

**"Should"** or **"may"** means recommended.

**"Standard safeguard"** means a device designed and constructed to remove a hazard related to the machine, appliance, tool, building, or equipment to which it is attached.

**"Working day,"** for appeals and accident reporting, means a calendar day, except Saturdays, Sundays, and legal holidays as defined by RCW 1.16.050. To compute the time within which an act is to be completed, exclude the first working day and include the last.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-009, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-012 What does it mean when equipment is approved by a nonstate organization?** Whenever the department requires that you have equipment or processes approved by an organization such as the Underwriters Laboratories (UL), the Bureau of Mines (MSHA), or the National Institute for Occupational Safety and Health (NIOSH), the approval of that organization is considered evidence of your compliance.

[97-09-013, recodified as § 296-307-012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-015 What must an employer do if a serious injury occurs?** (1) You must report to us within eight hours of an incident that:

- Causes a fatal or possibly fatal injury;
- Involves acute injury or illness from exposure to pesticides; or
- Causes injury requiring in-patient hospitalization of any employee.

To report, you must contact your nearest labor and industries office by phone or in person, or call the OSHA toll-free hotline, 1-800-321-6742.

**EXCEPTION:** If you do not learn of a reportable incident when it happens, you must report it within eight hours of learning about the incident.

(a) Your report must include:

- Establishment name;
- Location of the incident;
- Time of the incident;
- Number of fatalities, hospitalized employees, or pesticide exposures;
- Contact person;
- Phone number; and
- Brief description of the incident.

(b) Fatalities or hospitalizations that occur within thirty days of an incident must also be reported.

(2) If a department investigator asks for assistance, you must assign the employees that the investigator requests.

(3) Do not move any equipment involved in the incident until we complete an investigation.

**EXCEPTION:** You may move equipment to prevent additional incidents, or to remove the victim.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-015, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060. 96-22-048, § 296-306A-015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-018 What are the employer's responsibilities?**

**You must:**

- (1) Provide a safe and healthful working environment.
- (2) Ensure that employees do not use defective or unsafe tools and equipment, including tools and equipment that may be furnished by the employee.
- (3) Implement a written accident prevention program as required by these standards.
- (4) Implement a hazard communication program as required by WAC 296-307-550.
- (5) Establish a system for reporting and recording accidents on the OSHA 200 log. (See chapter 296-27 WAC.)
- (6) Provide safety education and training programs.
- (7) Implement the requirements of WAC 296-62-074 through 296-62-07451 to ensure the safety of employees who are exposed to cadmium in the workplace.
- (8) Implement the requirements of WAC 296-307-642 through 296-307-656 to ensure the safety of employees who are exposed to confined spaces in the workplace.
- (9) Control chemical agents.

**You must:**

- Control chemical agents in a manner that they will not present a hazard to your workers; or
- Protect workers from the hazard of contact with, or exposure to, chemical agents.

**Reference:** Pesticides are chemical agents and are covered by chapter 296-307 WAC Part I, Pesticides (worker protection standard). Pesticides may also be covered by WAC 296-307-594, Respirators.

(10) Protect employees from biological agents.

**You must:**

- Protect employees from exposure to hazardous concentrations of biological agents that may result from processing, handling or using materials or waste.

**Note:** Examples of biological agents include:  
 – Animals or animal waste  
 – Body fluids  
 – Biological agents in a medical research lab  
 – Mold or mildew.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-018, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-018, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050. 01-17-033, § 296-307-018, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-018, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-021 What are the employee's responsibilities?** (1) Employees must cooperate with you and other employees in efforts to eliminate accidents.

(2) Employees must be informed of and observe all safe practices.

(3) Employees must notify you of unsafe conditions of equipment or workplaces.

(4) Employees must use all required safety devices and protective equipment.

(5) Employees must not willfully damage personal protective equipment.

(6) Each employee must promptly report any job-related injury or illness to his or her immediate supervisor, regardless of the degree of severity.

(7) Employees must not engage in any activity unrelated to work that may cause injury to other employees during the course of performing work assignments.

(8) Employees must attend any required training and/or orientation programs designed to increase their competency in occupational safety and health.

(9) Employees must not report to work under the influence of alcohol or controlled substances. Alcohol or controlled substances must not be brought on the worksite.

[97-09-013, recodified as § 296-307-021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-024 How does an employer apply for a variance?** (1) If you find that it is impractical for you to comply with specific requirements of this standard, we may permit a variation from the requirements. However, you must still provide equal protection by substitute means and comply with the requirements of chapter 49.17 RCW and chapter 296-350 WAC, variances.

(2) On the variance application you must certify that you have posted a copy of the written application in a place reasonably accessible to your employees. You must also mail a copy of the application to any authorized employee representative. The notice must advise employees of their right to request us to conduct a hearing on the variance application. You must notify employees before you apply.

Note: To request a permanent or temporary variance, you may write to: Department of Labor and Industries, WISHA Services, PO Box 44648, Olympia, WA 98504-4648. We will mail you an application form and instruction sheet. We will also send a copy of chapter 296-350 WAC, Variances, if you request it.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-024, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-024, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-024, filed 10/31/96, effective 12/1/96.]

### **Part B Accident Prevention Program; First-aid Requirements; Safe Place Standard**

**WAC 296-307-030 What are the required elements of an accident prevention program?** (1) You must instruct all employees in safe working practices at the beginning of employment. Your instruction must be tailored to the types of hazards to which employees are exposed.

(2) You must develop a written accident prevention program tailored to the needs of your agricultural operation and to the types of hazards involved.

(3) Your accident prevention program must contain at least the following elements:

(a) How, when, and where to report injuries and illnesses, and the location of first-aid facilities.

(b) How to report unsafe conditions and practices.

(c) The use and care of personal protective equipment.

(2007 Ed.)

(d) What to do in emergencies. See WAC 296-307-35015 for emergency action plan requirements.

(e) Identification of hazardous chemicals or materials and the instruction for their safe use.

(f) An on-the-job review of the practices necessary to perform job assignments in a safe and healthful manner.

(4) At least once a month, you must conduct a walk-around safety inspection of active job sites, the materials and equipment involved, and operating procedures. A representative chosen by employees must be invited and allowed to accompany you.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-030, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-030, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-030, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-033 How often must safety meetings be held?** (1) Foreman-crew safety meetings must be held at least monthly or whenever there are significant changes in job assignments. These meetings must be tailored to the particular operation or activity occurring at the time.

(2) The meeting minutes must document subjects discussed and attendance.

(3) Short-term operations that last less than one month, such as harvesting, do not require foreman-crew safety meetings but only require initial safety orientation for the operations.

(4) You must maintain copies of the minutes of each foreman-crew safety meeting at the location where the majority of employees report to work each day.

(5) You must retain minutes of foreman-crew safety meetings for one year and be able to show us copies if we ask to see them.

[97-09-013, recodified as § 296-307-033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-036 What items go on the safety bulletin board?** (1) You must provide a bulletin board or posting area large enough to display the required safety and health poster, "Job Safety and Health Protection" (F416-081-000), and other safety education material.

(2) The bulletin board must be readily visible in a place where employees gather during some part of the work day. (For example, at the entrance to a field, a parking area, or in a farm building.)

(3) If for any reason any employee is unable to read the notices posted on the bulletin board, you must ensure that the message of the required poster explaining employee rights is communicated to the employee in terms he or she understands. This same requirement applies to variance applications, denials or grants, and to any other notice affecting the employee's rights under WISHA.

(4) Posting must be in the employees' language.

[97-09-013, recodified as § 296-307-036, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-036, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2381]

**WAC 296-307-039 First-aid rule summary.** Your responsibility: Make sure first-aid trained personnel are available to provide quick and effective first aid.

You must:

Make sure that first-aid trained personnel are available to provide quick and effective first aid.

*WAC 296-307-03905.*

Make sure appropriate first-aid supplies are readily available.

*WAC 296-307-03920.*

- Note:**
- Employers who require their employees to provide first aid must comply with the bloodborne pathogen rule, chapter 296-823 WAC.
  - Additional requirements relating to first aid are also located in the following sections:
    - WAC 296-307-07013(12), What rules apply to vehicles used to transport employees?
    - WAC 296-307-16175, First-aid requirements for operators of temporary worker housing.
    - WAC 296-307-16380, First-aid requirements for operators of cherry harvest camps.

Definitions:

**First aid:** The extent of treatment you would expect from a person trained in basic first aid, using supplies from a first-aid kit.

**Emergency medical service:** Medical treatment and care given at the scene of any medical emergency or while transporting any victim to a medical facility.

You can get copies of these rules by calling 1-800-4BE SAFE (1-800-423-7233), or by going to <http://www.lni.wa.gov>.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-039, filed 12/21/04, effective 4/2/05; 04-07-160, § 296-307-039, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050. 02-12-098, § 296-307-039, filed 6/5/02, effective 8/1/02; 01-17-033, § 296-307-039, filed 8/8/01, effective 9/1/01. 97-09-013, recodified as § 296-307-039, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-039, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-03905 Make sure that first-aid trained personnel are available to provide quick and effective first aid.**

**You must:**

Comply with the first-aid training requirements of 29 CFR 1910.151(b) which states:

"In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid."

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 04-07-160, § 296-307-03905, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-03905, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-03920 Make sure appropriate first-aid supplies are readily available.** You must:

- Make sure first-aid supplies are readily available. (See first-aid kit table.)
- Make sure first-aid supplies at your workplace are appropriate to:
  - Your occupational setting.
  - The response time of your emergency medical services.

**First-Aid Kit Table**

Number of employees normally assigned to worksite	Minimum first-aid supplies required at worksite
1 - 15 Employees	1 First-aid kit

Number of employees normally assigned to worksite	Minimum first-aid supplies required at worksite
16 - 30 Employees	2 First-aid kits
31 - 50 Employees	3 First-aid kits

Note:

- First-aid kits from your local retailer or safety supplier should be adequate for most nonindustrial employers.
- The following is a list of suggested items for your first-aid kit:
  - 1 absorbent compress, 4 x 8 inches
  - 16 adhesive bandages, 1 x 3 inches
  - 1 adhesive tape, 5 yards long
  - 10 antiseptic single-use packages, 0.5 g application
  - 6 burn treatment single-use packages, 0.5 g application
  - 1 eye covering (for two eyes)
  - 1 eye wash, 1 fluid ounce
  - 4 sterile pads, 3 x 3 inches
  - 2 pair of medical exam gloves
  - 1 triangular bandage, 39 x 39 x 55 inches
- Optional first-aid kit contents
  - Bandage compresses, 2 x 2 inches, 3 x 3 inches and 5 x 5 inches
  - Self-activating cold packs, 4 x 5 inches
  - Roller bandages, 6 yards long
  - Mouth-to-mouth barrier for CPR
- Kits should be checked at least weekly to ensure adequate number of needed items are available.
- Kits may be carried in any motor vehicle that is used near the crew.

**You must:**

- Make sure that first-aid supplies are:
  - Easily accessible to all your employees.
  - Stored in containers that protect them from damage, deterioration, or contamination. Containers must be clearly marked, not locked, and may be sealed.
  - Able to be moved to the location of an injured or acutely ill worker.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-03920, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-03920, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-03930 Make sure emergency washing facilities are functional and readily accessible.**

**You must:**

- Provide an emergency shower:
  - When there is potential for major portions of an employee's body to contact corrosives, strong irritants, or toxic chemicals
  - That delivers water to cascade over the user's entire body at a minimum rate of 20 gallons (75 liters) per minute for fifteen minutes or more.
- Provide an emergency eyewash:
  - When there is potential for an employee's eyes to be exposed to corrosives, strong irritants, or toxic chemicals
  - That irrigates and flushes both eyes simultaneously while the user holds their eyes open
  - With an on-off valve that activates in one second or less and remains on without user assistance until intentionally turned off
  - That delivers at least 0.4 gallons (1.5 liters) of water per minute for fifteen minutes or more.

**Note:**

- Chemicals that require emergency washing facilities:
  - You can determine whether chemicals in your workplace require emergency washing facilities by looking at the material safety data sheet (MSDS) or similar documents. The MSDS contains information about first-aid requirements and emergency flushing of skin or eyes
  - For chemicals developed in the workplace, the following resources provide information about first-aid requirements:

– NIOSH Pocket Guide to Chemical Hazards  
 • \*DHHS (NIOSH) Publication No. 97-140  
 • \*<http://www.cdc.gov/niosh/npg/ggdstart.html>  
 – Threshold Limit Values for Chemical Substances and Physical Agents American Conference of Governmental Industrial Hygienists (ACGIH).

**You must:**

- Make sure emergency washing facilities:
  - Are located so that it takes no more than ten seconds to reach
  - Are kept free of obstacles blocking their use
  - Function correctly
  - Provide the quality and quantity of water that is satisfactory for emergency washing purposes.

**Note:**

- If water in emergency washing facilities is allowed to freeze, they will not function correctly. Precautions need to be taken to prevent this from happening
- The travel distance to an emergency washing facility should be no more than fifty feet (15.25 meters)
- For further information on the design, installation, and maintenance of emergency washing facilities, see American National Standards Institute (ANSI) publication Z358.1 - 1998, *Emergency Eyewash and Shower Equipment*. Emergency washing facilities that are designed to meet ANSI Z358.1 - 1998 also meet the requirements of this standard. The ANSI standard can be obtained from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

**Reference:**

- Training in the location and use of your emergency washing facilities is required under the employer chemical hazard communication rule, WAC 296-307-550, and the accident prevention program rule, WAC 296-307-030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-03930, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-03935 Inspect and activate your emergency washing facilities.****You must:**

- Make sure all plumbed emergency washing facilities are inspected once a year to make sure they function correctly.

**Note:**

- Inspections should include:
  - Examination of the piping
  - Making sure that water is available at the appropriate temperature and quality
  - Activation to check that the valves and other hardware work properly
  - Checking the water flow rate.

**You must:**

- Make sure plumbed emergency eyewashes and hand-held drench hoses are activated weekly to check the proper functioning of the valves, hardware, and availability of water
- Make sure all self-contained eyewash equipment and personal eyewash units are inspected and maintained according to manufacturer instructions.
  - Inspections to check proper operation must be done once a year
  - Sealed personal eyewashes must be replaced after the manufacturer's expiration date.

**Note:** Most manufacturers recommend replacing fluid in open self-contained eyewashes every six months. The period for sealed containers is typically two years.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-03935, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-03940 Make sure supplemental flushing equipment provides sufficient water.**

**Note:** Supplemental flushing equipment cannot be used in place of required emergency showers or eyewashes.

(2007 Ed.)

**You must:**

- Make sure hand-held drench hoses deliver at least 3.0 gallons (11.4 liters) of water per minute for fifteen minutes or more.

**Note:** Why use a drench hose? A drench hose is useful when:
 

- The spill is small and does not require an emergency shower
- Used with a shower for local rinsing, particularly on the lower extremities.

**You must:**

- Make sure personal eyewash equipment delivers only clean water or other medically approved eye flushing solutions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-03940, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-03945 Definitions.****Corrosive**

As used in first aid, WAC 296-307-039, is a substance that causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above.

**Emergency washing facilities**

Emergency washing facilities are emergency showers, eyewashes, eye/face washes, hand-held drench hoses, or other similar units.

**Hand-held drench hoses**

Hand-held drench hoses are single-headed emergency washing devices connected to a flexible hose that can be used to irrigate and flush the face or other body parts.

**Personal eyewash units**

Personal eyewash units are portable, supplementary units that support plumbed units or self-contained units, or both, by delivering immediate flushing for less than fifteen minutes.

**Strong irritant**

As used in first aid, WAC 296-307-039, is a chemical that is not corrosive, but causes a strong, temporary inflammatory effect on living tissue by chemical action at the site of contact.

**Toxic chemical**

As used in first aid, WAC 296-307-039, is a chemical that produces serious injury or illness when absorbed through any body surface.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-03945, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-045 What are the requirements of the safe place standard?** (1) You must furnish to each employee a place of employment free from recognized controllable hazards likely to cause serious injury or death.

(2) You must furnish and require employees to use any safety devices and safeguards that are needed to control recognized hazards. All agricultural methods, operations, and processes must be designed to promote the safety and health of employees.

(3) You must not require an employee to engage in any duty or enter any place that is not safe.

(4) The following are prohibited:

(a) Removing, displacing, damaging, destroying or carrying off any safety device, safeguard, notice or warning intended for use in any place of employment.

[Title 296 WAC—p. 2383]

(b) Interfering in any way with the use of any safety device, method or process adopted for the protection of any employee.

(5) Intoxicating beverages or narcotics in or around worksites. Employees under the influence of alcohol or narcotics are prohibited from the worksite.

Exception: This rule does not apply to anyone taking prescription drugs and/or narcotics as directed by a physician providing such use does not endanger the employee or others.

[97-09-013, recodified as § 296-307-045, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-045, filed 10/31/96, effective 12/1/96.]

### Part C Hand Tools

**WAC 296-307-050 What requirements apply to hand tools?** (1) Using hoes with handles less than four feet long or any hand tool used for weeding or thinning crops in a stooped position, is prohibited.

(2) You must ensure that hand tools are in good condition. Using defective hand tools is prohibited.

(3) You must ensure that hand tools are stored safely when not in use.

[97-09-013, recodified as § 296-307-050, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-050, filed 10/31/96, effective 12/1/96.]

### Part D Ladders, Bulk Storage, Pits, and Trenches

#### WAC 296-307-055 Ladders.

[97-09-013, recodified as § 296-307-055, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-055, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-05501 How must ladders be cared for and maintained?** (1) Ladders must be checked for defects before use, and thoroughly inspected periodically. Ladders shall be inspected immediately in the following situations:

(a) If a ladder tips over, inspect for side rails dents or bends, or excessively dented rungs; check all rung-to-side-rail connections; check hardware connections; check rivets for shear.

(b) If a ladder is exposed to excessive heat, inspect visually for damage and test for deflection and strength characteristics. If you are unsure about the ladder's condition, seek help from the manufacturer.

(2) Ladders must be maintained in good condition at all times. Joints between steps and side rails must be tight. All hardware and fittings must be securely attached, and the moveable parts must operate freely without binding or with too much play.

(3) Defective ladders must be withdrawn from service for repair or destruction and tagged as "Dangerous—Do not use."

(4) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment must not be used; improvised repairs must not be made.

(5) Ladders must be handled with care. Avoid unnecessary dropping, jarring, or misuse.

[Title 296 WAC—p. 2384]

(6) Ladder storage must:

(a) Protect the ladder when not in use;

(b) Provide sufficient support to prevent excessive sagging;

(c) Provide ease of access or inspection; and

(d) Prevent danger of accidents when withdrawing a ladder for use.

[97-09-013, recodified as § 296-307-05501, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-05501, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-05503 How must an employer instruct employees to use ladders?** (1) At the beginning of employment, you must provide employees with orientation and training on the proper use of ladders, including how to set a ladder and properly dismount with a full load.

(2) To prevent ladder upset, you must instruct employees to avoid overreaching while standing on the ladder.

(3) You must instruct employees that before climbing ladders; rungs, shoes, and boots must be clean of substances that would make them hazardous.

(4) Employees must not climb up or down ladders while carrying tools or materials that interfere with the free use of both hands.

(5) Ladders must not be placed on boxes, barrels, or other unstable bases to obtain additional height.

(6) Stepladders must not be used as single ladders.

(7) When working from a ladder over twenty-five feet from the ground or floor, the ladder must be secured at both top and bottom. When work on a ladder over twenty-five feet from the ground or floor requires the use of both hands, a safety belt must be worn and the safety lanyard secured to the ladder.

(8) Portable ladders must be placed so that the side rails have a secure footing. The top rest for portable rung and cleat ladders must be reasonably rigid and strong enough to support the applied load. The top of the ladder must be placed with the two rails supported, unless equipped with a single support attachment. Such an attachment should be substantial and large enough to support the ladder under load.

(9) Ladders carried on vehicles should be adequately supported to avoid sagging and securely fastened in position to minimize chafing and the effects of road shocks.

[97-09-013, recodified as § 296-307-05503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-05503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-05505 How must orchard ladders be used?** (1) Orchard ladders longer than sixteen feet are prohibited.

(2) Employers must instruct employees to not stand on the top two steps (the top cap and the next step down) of orchard ladders.

(3) Employers must instruct employees to not step off the ladder onto branches of trees except onto the main crotch.

(4) Standing on the top two steps of the orchard ladder is prohibited.

[97-09-013, recodified as § 296-307-05505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-05505, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-05507 What other requirements apply to ladders?** (1) Ladders made by fastening cleats across a single rail are prohibited.

(2) Wood ladders, when not in use, should be stored where they will not be exposed to the elements, but where there is good ventilation. They must be stored away from radiators, stoves, steam pipes, or other excessive heat or dampness.

(3) Wooden ladders should be kept coated with a suitable protective material. Painted ladders are acceptable if the ladders are carefully inspected prior to painting by competent and experienced inspectors acting for, and responsible to, the purchaser, and if the ladders are not for resale.

(4) A ladder must have feet that are appropriate for the surface on which it will be used.

For example: A ladder used on a slippery surface must have steel points or other nonslip material on its feet.

(5) Ladders must not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

(6) Ladder safety devices may be used on tower, water tank and chimney ladders over twenty feet long in place of cage protection. No landing platform is required in these cases. All ladder safety devices such as lifelines, friction brakes, and sliding attachments must meet the design requirements of the ladders that they serve.

(7) See chapter 296-307 WAC Part K for requirements related to working near overhead lines.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-05507, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-05507, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-05507, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-060 What requirements apply to job-made ladders?** A "job-made ladder" is a ladder that you or your employees build.

Job-made ladders must meet the following requirements:

(1) All cleats must be made of one-by-four-inch nominal lumber, or stronger.

(2) Cleats must be inset into the edges of side rails to a depth of one-half inch, or filler blocks must be used on the rails between the cleats.

(3) Each cleat must be fastened to each rail with three 8d common wire nails or other fasteners of equal strength.

(4) Cleats must be uniformly spaced approximately 12 inches from the top of one cleat to the top of the next.

(5) Side rails must be continuous, unless splices develop the full strength of a continuous rail of equal length.

[97-09-013, recodified as § 296-307-060, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-060, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-061 What requirements apply to working around bins, bunkers, hoppers, tanks, pits, and trenches?** (1) Employees must be prohibited from entering any bin, bunker, hopper, or similar area when loose materials (such as chips, sand, grain, gravel, sawdust, etc.) may collapse, unless the employee wears a safety belt with a lifeline attached and is attended by a helper.

**Note:** Silage pits are exempt from this section.

**Reference:** For requirements relating to confined spaces, see WAC 296-307-642 through 296-307-656.

(2) When employees are required to work in a trench or a pit 4 feet deep or more, the trench or the pit must be shored or sloped according to the following table:

SOIL OR ROCK TYPE MAXIMUM ALLOWABLE	SLOPES (H:V) (1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP (2)
STABLE ROCK	VERTICAL (90°)
TYPE A	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 1/2:1 (34°)

- 1 Numbers in parentheses next to maximum allowable slopes are angles in degrees from the horizontal. Angles have been rounded off.
- 2 Sloping or benching for excavations greater than 20 feet deep must be designed by a registered professional engineer.

(3) Each soil and rock deposit must be classified by a competent person as Stable Rock, Type A, B, or C according to the definitions in WAC 296-155-66401. "Competent person" means someone who is able to identify working conditions that are hazardous to employees, and has authority to take prompt action to eliminate the hazards.

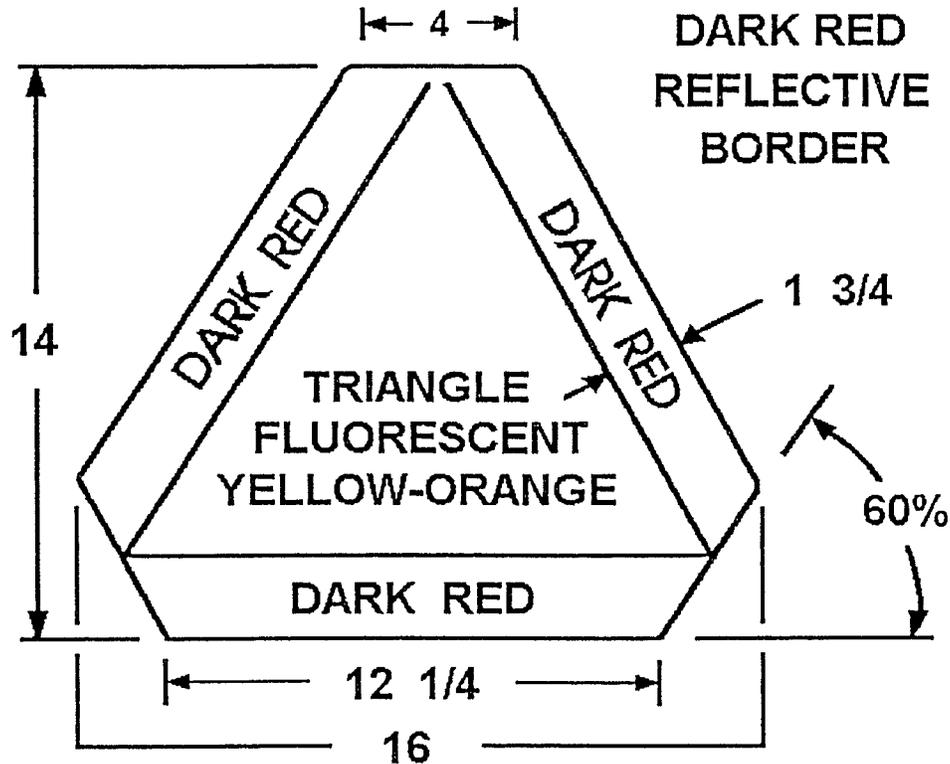
(4) Classification of the deposits must be based on the results of at least one visual and at least one manual analysis. The analyses must be conducted by a competent person using tests in recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-061, filed 12/21/04, effective 4/2/05. 97-09-013, recodified as § 296-307-061, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-061, filed 10/31/96, effective 12/1/96.]

**Part E**  
**Vehicles and Farm Field Equipment**

**WAC 296-307-065 How must slow-moving vehicles be marked?** (1) You must ensure that all farm tractors and other slow-moving farm vehicles and equipment used on public roads have lamps, reflectors, and a slow-moving vehicle emblem. From one-half hour after sunset to one-half hour before sunrise, slow-moving vehicles must have lights and reflectors.

(2) The slow-moving vehicle emblem is a fluorescent yellow-orange triangle with a dark red reflective border. (See figure.) The emblem must be used on public roads only by vehicles designed to move slowly (25 M.P.H. or less).



[97-09-013, recodified as § 296-307-065, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-065, filed 10/31/96, effective 12/1/96.]

#### WAC 296-307-070 Motor vehicles.

[97-09-013, recodified as § 296-307-070, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-070, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-07001 How must motor vehicles be maintained?** (1) You must maintain all motor vehicles and their parts in good repair and safe condition.

(2) You must not use tires that are worn beyond the point of safety.

(3) Employees must report to you any motor vehicle or other farm equipment that is in unsafe operating condition. You must ensure that the vehicle or equipment is removed from service and repaired before use.

(4) Before an employee performs service or repair work under hydraulic or mechanical raised dump truck beds, blades, discs, or other equipment, the raised portion of the equipment must be manually pinned or blocked to prevent falling.

[97-09-013, recodified as § 296-307-07001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-07003 How must motor vehicles be operated?** (1) Vehicles must be driven at safe operating speed.

(2) Truck drivers must operate equipment at a safe speed for roadway conditions.

(3) When an employee backing a truck has obstructed vision, the employee must be assisted by a signaler. The sig-

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nal must have a clear view of the rear of the truck and the operator of the truck.

(4) Truck drivers must sound their horn before starting to back, and intermittently while backing.

(5) Shut off motors before refueling. Take care to prevent fuel from spilling on hot parts.

[97-09-013, recodified as § 296-307-07003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-07005 Who may operate motor vehicles?** Only qualified drivers may operate motor vehicles and must have a current motor vehicle operator's license.

[97-09-013, recodified as § 296-307-07005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-07007 What requirements apply to motor vehicle brakes?** (1) You must ensure that motor vehicles have brakes that will safely hold the maximum load on maximum grades.

(2) Trucks parked on an incline must have the steered wheels turned into the curb and must have at least one "driver" wheel chocked on each side, independent of the braking system.

Exception: If the truck has a functioning secondary braking system, the turned wheels and chock are not required.

(3) You must ensure that trailers have working air brakes, or another approved type. Air must be cut into the

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trailer brake system at the time that the trailer is coupled to the truck.

(4) The driver must test truck and trailer brakes before driving down a steep grade.

[97-09-013, recodified as § 296-307-07007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-07009 How must motor vehicles be loaded and unloaded?** (1) You must ensure that employees load and unload motor vehicles safely.

(2) All loads transported on trucks or truck and trailer combinations must be properly secured and distributed. Loads must not exceed the safe operating load for the roadway condition and the capacity of the bridges, trestles, and other structures.

[97-09-013, recodified as § 296-307-07009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-07011 What safety equipment must motor vehicles have?** All motor vehicles must have standard lights, horn, flags, flares, and other safety equipment that conforms to the state of Washington motor vehicles laws.

[97-09-013, recodified as § 296-307-07011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-07013 What rules apply to vehicles used to transport employees?** You must ensure that motor vehicles used regularly to transport employees meet the following requirements:

(1) The vehicles are well equipped, covered against the weather, and maintained in good mechanical condition at all times.

(2) A sufficient number of properly secured seats are provided in each vehicle to accommodate the number of employees transported. When emergency conditions make it necessary to transport more employees than the seating capacity can accommodate, all employees must ride within the vehicle. No employee may ride on fenders or running boards of the vehicle.

(3) No employees may ride in or on any vehicle with their legs hanging over the end or sides. All trucks without tail gates should have safety bars.

(4) The vehicles have storage strong enough to retain sharp tools that could present a hazard to employees being transported.

(5) All dump-trucks used to transport employees have an adequate safety chain or locking device to ensure that the body of the truck is not raised while employees are riding in it.

(6) Explosives or highly inflammable materials are not carried in or on the vehicle while it is used to transport employees.

(7) Exhaust systems are installed and maintained in proper condition, and are designed to eliminate the employee exposure to exhaust gases and fumes.

(8) Within the cab, crew trucks must carry only the number of passengers for which they are designed. In any seating arrangement, the driver must be able to maintain full freedom

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of motion. The driver's normal vision must be free from obstruction by passengers or the seating arrangement.

(9) All enclosed crew trucks have an emergency exit in addition to the regular entrance.

(10) Trucks used for hauling gravel may be used as crew trucks if they meet the following requirements:

(a) Steps in proper places;

(b) Wooden floors;

(c) Securely fastened seats;

(d) Truck is properly covered; and

(e) Compliance with all other general regulations covering crew trucks.

(11) Half-ton vehicles must haul no more than six persons including driver. Three-quarter-ton vehicles must haul no more than eight persons including driver.

(12) The vehicle is equipped with the first-aid supplies required by WAC 296-307-03920, two blankets, and a fire extinguisher.

Note: Additional requirements relating to first aid are located in WAC 296-307-039.

(13) Heating units with open fires are not used in vehicles transporting crews.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-07013, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050. 01-17-033, § 296-307-07013, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-07013, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-07013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-073 What requirements apply to changing and charging storage batteries?** (1) Battery changing installations must be located in areas designated for that purpose.

(2) Facilities must be provided for:

- Flushing and neutralizing spilled electrolyte;
  - Fire protection;
  - Protecting charging apparatus from damage by trucks;
- and
- Adequate ventilation of fumes from gassing batteries.

(3) Racks used to support batteries should be made of or covered with materials that will not create sparks.

(4) A conveyor, overhead hoist, or equivalent material handling equipment must be provided for handling batteries.

(5) Reinstalled batteries must be properly positioned and secured in the vehicle.

(6) A carboy tilter or siphon must be provided for handling electrolyte.

(7) When mixing water and acid for charging batteries, pour acid into water; do not pour water into acid.

(8) Vehicles must be properly positioned and the brake applied before attempting to change or charge batteries.

(9) When charging batteries, the vent caps should be kept in place to avoid electrolyte spray. You must ensure that vent caps function. The battery (or compartment) cover(s) must be open for cooling.

(10) Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

(11) Tools and other metallic objects must be kept away from the tops of uncovered batteries.

[97-09-013, recodified as § 296-307-073, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-073, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-076 How must farm field equipment be guarded?** "Farm field equipment" means tractors or implements, including self-propelled implements, used in agricultural operations.

(1) All power transmission components must be guarded according to WAC 296-307-280.

(2) The manufacturer's instruction manual, if published by the manufacturer and currently available, must be the source of information for the safe operation and maintenance of field equipment.

(3) You must ensure that all power takeoff shafts, including rear, mid-mounted or side-mounted shafts, are guarded by a master shield, as follows:

(a) The rear power takeoff has a master shield. The master shield is strong enough to prevent permanent deformation of the shield when a 250-pound operator mounts or dismounts the tractor using the shield as a step.

(b) Power takeoff driven equipment is guarded to prevent employee contact with rotating members of the power drive system. When the tractor master shield must be removed to use specific power takeoff driven equipment, the equipment must provide protection from the part of the tractor power takeoff shaft that protrudes from the tractor.

(c) Signs are placed at prominent locations on the tractor and on power takeoff driven equipment requiring that safety shields are kept in place.

(4) The following functional components must be shielded to a degree consistent with the intended function and operator's vision of the component.

- Snapping or husking rolls;
- Straw spreaders and choppers;
- Cutterbars;
- Flail rotors;
- Rotary beaters;
- Mixing augers;
- Feed rolls;
- Conveying augers;
- Rotary tillers; and
- Similar units that must be exposed for proper function

(5) Where removing a guard or access door will expose an employee to any component that continues to rotate after the power is disengaged, you must provide, in the immediate area:

(a) A safety sign warning the employee to look and listen for evidence of rotation and to wait until all components have stopped before removing the guard or access door.

(b) A readily visible or audible warning of rotation on equipment manufactured after October 25, 1976.

(6) If the mounting steps or ladder and the handholds of the propelling vehicle are made inaccessible by installation of other equipment, other steps and handholds must be provided on the equipment.

(7) You must ensure that the operator's steps and platform have a slip-resistant covering to minimize the possibility of slipping.

(8) Powered machines not driven by an individual motor must have a clutch or other effective means of stopping.

(9) All friction clutches must have sufficient clearance and be kept adjusted to prevent drag or creeping when disengaged.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-076, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-076, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-076, filed 10/31/96, effective 12/1/96.]

## Part F

### Rollover Protective Structures (ROPS) for Tractors

#### WAC 296-307-080 Rollover protective structures (ROPS) for tractors.

[97-09-013, recodified as § 296-307-080, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-080, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-08003 Which agricultural tractors are covered by this section?** All agricultural tractors manufactured after October 25, 1976, must meet the requirements of WAC 296-307-080. An agricultural tractor manufactured on or before October 25, 1976, must meet the requirements of WAC 296-307-080 if:

(1) The tractor was built or sold with rollover protective structures (ROPS) as an optional accessory; or

(2) According to the manufacturer, the tractor was designed to accommodate the addition of ROPS.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-08003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-08006 What definitions apply to rollover protective structures (ROPS) for agricultural tractors?** "Agricultural tractor" means a two-wheel-drive or four-wheel-drive vehicle, or a track vehicle of more than twenty net engine horsepower, designed to furnish the power to pull, carry, propel, or drive implements that are designed for agriculture. All human-powered implements are excluded.

"Low profile tractor" means a wheel or track-equipped vehicle with the following characteristics:

- The front wheel spacing is equal to the rear wheel spacing, as measured between the centerlines of the wheels;
- The clearance from the bottom of the tractor chassis to the ground is eighteen inches or less;
- The highest point of the hood is sixty inches or less, and
- The tractor is designed so that the operator straddles the transmission when seated.

[97-09-013, recodified as § 296-307-08006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-08009 What requirements apply to the testing and performance of ROPS used on agricultural tractors?** You must provide a rollover protective structure (ROPS) for each employee-operated tractor that is covered by WAC 296-307-080. ROPS used on wheel-type tractors must meet the test and performance requirements of

OSHA 1928.51 CFR. Protective frames for wheel type agricultural tractors, and ROPS used on track-type tractors must meet the test and performance requirements of SAE Standard J334a (July 1970) and the portions of SAE Standard J167 (1971) pertaining to overhead protection requirements.

[Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050. 02-12-098, § 296-307-08009, filed 6/5/02, effective 8/1/02. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-08009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-08012 What requirements apply to seatbelts used with ROPS on agricultural tractors?** (1) Where ROPS are required by WAC 296-307-080, you must:

- (a) Provide each tractor with a seatbelt;
  - (b) Require that each employee use the seatbelt while the tractor is moving; and
  - (c) Require that each employee tighten the seatbelt sufficiently to confine the employee to the ROPS protected area.
- (2) Each seatbelt and seatbelt anchorage must meet the requirements of ANSI/SAE J800 April 1986, Motor Vehicle Seat Belt Assemblies.

- (a) Where a suspended seat is used, the seatbelt must be fastened to the movable portion of the seat.
- (b) The seatbelt webbing material must be at least as resistant to acids, alkalis, mildew, aging, moisture and sunlight as untreated polyester fiber.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08012, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-08012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-08015 When are ROPS not required on agricultural tractors?** ROPS are not required on agricultural tractors that are used as follows:

- (1) Low profile tractors used in orchards, vineyards or hop yards where the vertical clearance requirements would substantially interfere with normal operations, and for work related to these uses.
- (2) Low profile tractors while used inside a farm building or greenhouse in which the vertical clearance is insufficient to allow a ROPS equipped tractor to operate.
- (3) Tractors while used with mounted equipment that is incompatible with ROPS (for example, cornpickers, cotton strippers, vegetable pickers, and fruit harvesters).
- (4) Track-type agricultural tractors whose overall width (measured between the outside edges of the tracks) is at least three times the height of the rated center of gravity, and whose rated maximum speed in forward or reverse is not greater than seven miles per hour, when used only for tillage or harvesting operations, and which:

- (a) Does not involve operating on slopes in excess of forty percent from horizontal; and
- (b) Does not involve operating on piled crop products or residue (for example: Silage in stacks or pits); and
- (c) Does not involve operating in close proximity to irrigation ditches, streams or other excavations more than two feet deep that contain slopes of more than forty percent from horizontal; and

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(d) Does not involve construction-type operation, such as bulldozing, grading, or land clearing.

[97-09-013, recodified as § 296-307-08015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-08018 What employee training requirements apply to ROPS used on agricultural tractors?** (1) You must ensure that every employee who operates an agricultural tractor is informed of the operating practices listed below and of any other practices dictated by the work environment. You must provide the information at the time of initial assignment and at least annually thereafter.

EXHIBIT A  
EMPLOYEE OPERATING INSTRUCTIONS

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments and holes.
3. Reduce speed when turning, crossing slopes and on rough, slick or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads and around trees.
6. Passengers, other than persons required for instruction or machine operation, shall not be permitted to ride on equipment unless a passenger seat or other protective device is provided.
7. Operate the tractor smoothly—no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

(2) You must ensure that every employee who operates an agriculture tractor is trained specifically in the operation of the tractor to be used. The training must include an orientation of the operator to the topographical features of the land where the tractor will be operated. Training must emphasize safe operating practices to avoid rollover.

(3) The tractor training program must be described in the written accident prevention program required by WAC 296-307-030.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08018, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-08018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-08-051A, § 296-306A-08018, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-08018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-08021 What other requirements apply to ROPS used on agricultural tractors?** (1) You must ensure that batteries, fuel tanks, oil reservoirs, and coolant systems are constructed and located or sealed to ensure that no spillage comes in contact with the operator in the event of an upset.

(2) All sharp edges and corners at the operator's station must be designed to minimize operator injury in the event of an upset.

(3) When ROPS are removed, they must be remounted to meet the requirements of WAC 296-307-080.

(4) You must ensure that each ROPS has a label, permanently affixed to the structure, that states:

- (a) Manufacturer's or fabricator's name and address;
- (b) ROPS model number, if any;
- (c) Tractor makes, models, or series numbers that the structure is designed to fit; and
- (d) That the ROPS model was tested in accordance with the requirements of this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-08021, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-08021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-085 When must ROPS be provided for material handling equipment?** (1) This section applies to the following types of material handling equipment: Rubber-tired, self-propelled scrapers; rubber-tired front-end loaders; rubber-tired dozers; wheel-type agricultural and industrial tractors; crawler tractors; crawler-type loaders; and motor graders, with or without attachments, that are used in agricultural work. This section does not apply to side-boom pipelaying tractors.

(2) You must ensure that material handling equipment manufactured on or after October 25, 1976, is equipped with ROPS that meet the minimum performance standards of WAC 296-307-08009.

(3) ROPS and supporting attachments must meet the minimum performance standards of OSHA 1928.52 CFR, Protective Frames for Wheel Type Agricultural Tractors, or must be designed, fabricated, and installed in a manner that will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

(a) The ROPS must be designed to minimize the likelihood of a complete overturn and to minimize the possibility of the operator being crushed in a rollover.

(b) The design must provide a vertical clearance of at least fifty-two inches from the work deck to the ROPS at the entrance.

(4) When ROPS are removed, they must be remounted so as to meet the requirements of this section.

(5) Each ROPS must have a label, permanently affixed to the structure, that states:

- (a) Manufacturer's or fabricator's name and address;
- (b) ROPS model number, if any;
- (c) Tractor makes, models, or series numbers that the structure is designed to fit; and
- (d) That the ROPS model was tested in accordance with the requirements of this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-085, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-085, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-085, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-090 What requirements apply to overhead protection for operators of agricultural and industrial tractors?** This section applies to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in agriculture work.

(1) If grid or mesh is used for overhead protection, the largest permissible opening is 1.5 in. (38 mm.) in diameter.

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The overhead protection must not be installed in such a way as to become a hazard in the case of upset.

(2) All equipment used in site clearing operations must have rollover guards meeting the requirements of this chapter. You must ensure that rider-operated equipment is equipped with an overhead and rear canopy guard meeting the following requirements:

(a) The overhead covering is at least eighth-inch steel plate or quarter-inch woven wire mesh with openings no greater than one inch, or equivalent.

(b) The opening in the rear of the canopy structure is covered with not less than quarter-inch woven wire mesh with openings no greater than one inch.

(3) Overhead protection that meets the provisions of SAE Standard J334 (July 1970) for rubber-tired dozers and rubber-tired loaders also meets the requirements of this standard.

[97-09-013, recodified as § 296-307-090, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-090, filed 10/31/96, effective 12/1/96.]

## Part G Field Sanitation

### WAC 296-307-095 Field sanitation.

[97-09-013, recodified as § 296-307-095, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-095, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-09503 What does this section cover?** WAC 296-307-095 applies to any agricultural employer with one or more employees engaged in any hand-labor operations in the field.

EXCEPTION: WAC 296-307-09515 (handwashing facilities) and 296-307-09518 (toilet facilities) do not apply if your employees:

- (1) Are engaged in field activities for the production of grains, livestock, or livestock feed; or
- (2) Use vehicles, machinery, or animals as part of their field activities and, when needed, can transport themselves to and from toilet and handwashing facilities.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-09503, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-09503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-09506 What definitions apply to this section?** "Accessible" means a maximum of one-quarter mile or five minutes travel time from the worksite.

"Hand-labor operations" means agricultural operations performed by hand or with hand tools.

For example: The hand cultivation, weeding, planting or harvesting of vegetables, nuts, fruit, seedlings or other crops, including mushrooms, and hand packing into containers.

EXCEPTION: Hand-labor does not include logging operations, the care or feeding of livestock, or hand-labor operations in permanent structures (e.g., canning facilities or packing houses).

"Handwashing facility" means a facility that meets the requirements of WAC 296-307-09515 and is approved by the local health authority.

"Toilet" means a fixed or portable facility designed for the purpose of adequate collection and containment of both

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defecation and urination. "Toilet" includes biological, chemical, flush, and combustion toilets, or sanitary outhouses.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-09506, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-09506, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09506, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-09509 What orientation must employers provide for field sanitation?** You must provide each employee with verbal orientation on field sanitation facilities. The orientation must be understandable to each employee and must include:

(1) The location of potable water supplies and the importance of drinking water frequently, especially on hot days;

(2) Identification of all nonpotable water at the worksite and prohibition of the use of nonpotable water for sanitation purposes with an explanation of the hazards associated with using nonpotable water;

(3) The location of handwashing facilities and the importance of handwashing:

(a) Before and after using the toilet; and

(b) Before eating and smoking; and

(4) The location of toilet facilities; an explanation that facilities are for employee convenience and health considerations; the necessity to keep them sanitary; and that using the fields, orchards, or forests is not an option.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-09509, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-09509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09509, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-09512 What potable water sources must an employer provide?** You must provide potable water for employees engaged in hand-labor operations in the field, without cost to the employee. Potable water must meet the following requirements:

(1) Potable water is in locations that are accessible to all employees.

(2) Potable water containers are refilled daily or more often as necessary.

(3) Potable water dispensers are designed, constructed, and serviced so that sanitary conditions are maintained. They are closeable and equipped with a tap.

(4) Open containers such as barrels, pails, or tanks for drinking water from which water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

(5) Any container used to distribute drinking water is clearly marked in English and with the appropriate international symbol describing its contents.

(6) Any container used to distribute drinking water is only used for that purpose.

(7) Potable water is suitably cool and provided in sufficient amounts, taking into account the air temperature, humidity, and the nature of the work performed, to meet employees' needs.

Note: Suitably cool water should be sixty degrees Fahrenheit or less. During hot weather, employees may require up to three gallons of water per day.

(8) The use of common drinking cups or dippers is prohibited. Water is dispensed in single-use drinking cups, personal containers, or by water fountains.

"Single-use drinking cups" means containers of any type or size, disposable or not, and including personal containers if the choice to use a personal container is made by the employee, not the employer.

(9) Employees must be prohibited from drinking from irrigation ditches, creeks or rivers. Potable water must meet the quality standards for drinking purposes of the state or local authority, or must meet quality standards of the United States Environmental Protection Agency's National Interim—Primary Drinking Water Regulations, published in 40 CFR Part 141 and 40 CFR 147.2400.

[97-09-013, recodified as § 296-307-09512, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09512, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-09515 What handwashing facilities must an employer provide?** You must provide handwashing facilities for employees engaged in hand-labor operations in the field, without cost to the employee. Handwashing facilities must meet the following requirements:

(1) One handwashing facility with a tap and an adequate supply of water, soap, single-use hand towels, and either a basin or other suitable container for washing is provided for each twenty employees or fraction of twenty.

Note: Nonpotable water must not be used for washing any part of a person, except as permitted by the local health authority.

(2) Each facility has running water.

(3) Each facility has a dispenser containing handsoap or a similar cleansing agent.

(4) Each facility has individual single-use hand towels.

(5) Facilities are maintained in a clean and sanitary condition according to appropriate public health sanitation practices.

(6) Waste receptacles are provided. Disposal of wastes from the facilities does not create a hazard nor cause an unsanitary condition.

(7) Employees are allowed reasonable time during the work period to use the facilities.

(8) Handwashing facilities are near toilet facilities and within one-quarter mile of each employee's worksite in the field.

Exception: Where it is not feasible to locate facilities as required above, the facilities must be located at the point of closest vehicular access.

[97-09-013, recodified as § 296-307-09515, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09515, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-09518 What toilet facilities must an employer provide?** You must provide toilet facilities for employees engaged in hand-labor operations in the field, without cost to the employee. Toilet facilities must meet the following requirements:

(1) One toilet facility is provided for each twenty employees or fraction of twenty.

(2) You must ensure, at the beginning of each day, that the toilets are inspected. If any toilet facility fails to meet the requirements of this section, immediate corrective action is

taken. Inspections are documented and the record maintained at the worksite for at least seventy-two hours.

(3) Toilet facilities are adequately ventilated; appropriately screened, and have self-closing doors that can be closed and latched from the inside. Toilet facilities are constructed to ensure privacy.

(4) Facilities are maintained in a clean, sanitary, and functional condition and according to appropriate public health sanitation practices.

(5) Toilets are supplied with toilet paper.

(6) Disposal of wastes from the facilities does not create a hazard or cause an unsanitary condition.

(7) Employees are allowed reasonable time during the work period to use the facilities.

(8) Facilities are near handwashing facilities and within one-quarter mile of each employee's worksite in the field.

Exception: Where it is not feasible to locate facilities as required above, the facilities must be located at the point of closest vehicular access.

[97-09-013, recodified as § 296-307-09518, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09518, filed 10/31/96, effective 12/1/96.]

## Part H Personal Protective Equipment

### WAC 296-307-100 Personal protective equipment.

[97-09-013, recodified as § 296-307-100, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-100, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-10005 Who must provide personal protective equipment?** (1) You must ensure that employees are protected from injury or impairment of any bodily function that might occur through absorption, inhalation or physical contact of any substance, vapor, radiation, or physical hazard. Wherever appropriate, you must ensure that employees use protective clothing; respiratory devices; shields; barriers; and adequate protective equipment for eyes, face, head, and extremities.

(2) You must provide personal protective equipment at no cost to employees, including replacement due to normal wear and tear. The equipment must be maintained in sanitary and reliable condition.

Exception: You may require employees to provide their own normal work clothing, including long-sleeved shirts, long-legged pants, and socks.

(3) If employees provide their own protective equipment, then you must ensure that the equipment is adequate, properly maintained, and sanitary.

[97-09-013, recodified as § 296-307-10005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-10010 What requirements apply to eye protection?** You must require eye protection wherever employees are exposed to flying objects, welding or cutting glare, injurious liquids, or injurious radiation. Eye protectors must meet the criteria of the American National Standard for Occupational and Educational Eye and Face Protection.

[Title 296 WAC—p. 2392]

[97-09-013, recodified as § 296-307-10010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10010, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-10015 How must personal protective equipment be used?** (1) You must ensure that employees use personal protective equipment according to the manufacturer's instructions.

(2) You must ensure that, before each use, employees inspect all personal protective equipment for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(3) The employee must use personal protective equipment according to instructions and training received.

(4) The employee shall notify you of any defects in personal protective equipment or when the equipment becomes contaminated.

[97-09-013, recodified as § 296-307-10015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-10020 What must an employer do to prevent heat-related illness?** You must take appropriate measures to prevent heat-related illness that may be caused by employees wearing any required personal protective equipment.

[97-09-013, recodified as § 296-307-10020, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10020, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-10025 What instruction on personal protective equipment must an employer give to employees?** You must instruct each employee in the proper use of personal protective equipment. The instruction must include any special limitations or precautions indicated by the manufacturer.

[97-09-013, recodified as § 296-307-10025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10025, filed 10/31/96, effective 12/1/96.]

## Part I Pesticides (Worker Protection Standard)

**WAC 296-307-107 Federal worker protection standards—Washington state department of agriculture.** This part contains the federal Environmental Protection Agency worker protection standards as listed in 40 CFR, Part 170. Revisions to the federal language have been incorporated into this chapter in order to be consistent with other requirements of Washington state law. These rules are adopted in conjunction with rules adopted by the Washington state department of agriculture in chapter 16-233 WAC.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-107, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-107, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-107, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-110 Scope and purpose—Worker protection standards—40 CFR, § 170.1.** This part contains standards designed to reduce the risks of illness or injury

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resulting from workers' and handlers' occupational exposures to pesticides used in the production of agricultural plants on farms or in nurseries, greenhouses, and forests and also to reduce the accidental exposure of workers and other persons to such pesticides. It requires workplace practices designed to reduce or eliminate exposure to pesticides and establishes procedures for responding to exposure-related emergencies.

[97-09-013, recodified as § 296-307-110, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-110, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-11005 Definitions—Worker protection standards—40 CFR, § 170.3.** Terms used in this part have the same meanings they have in the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. In addition, the following terms, when used in this part, shall have the following meanings:

"Agricultural emergency" means a sudden occurrence or set of circumstances which the agricultural employer could not have anticipated and over which the agricultural employer has no control, and which requires entry into a pesticide treated area during a restricted-entry interval, when no alternative practices would prevent or mitigate a substantial economic loss.

"Agricultural employer" means any person who hires or contracts for the services of workers, for any type of compensation, to perform activities related to the production of agricultural plants, or any person who is an owner of or is responsible for the management or condition of an agricultural establishment that uses such workers.

*Note: This definition does not conflict with the definition of employer in WAC 296-307-012.*

"Agricultural establishment" means any farm, forest, nursery, or greenhouse.

"Agricultural plant" means any plant grown or maintained for commercial or research purposes and includes, but is not limited to, food, feed, and fiber plants; trees; turfgrass; flowers, shrubs; ornamentals; and seedlings.

"Animal premise" means the actual structure used to house, cage or confine animals such as: Barns, poultry houses, mink sheds, corrals, or structures used for shelter.

"Chemigation" means the application of pesticides through irrigation systems.

"Commercial pesticide handling establishment" means any establishment, other than an agricultural establishment, that:

- Employs any person, including a self-employed person, to apply on an agricultural establishment, pesticides used in the production of agricultural plants.
- Employs any person, including a self-employed person, to perform on an agricultural establishment, tasks as a crop advisor.

"Crop advisor" means any person who is assessing pest numbers or damage, pesticide distribution, or the status or requirements of agricultural plants and who holds a current Washington state department of agriculture commercial consultant license in the agricultural areas in which they are advising. The term does not include any person who is performing hand labor tasks.

"Early entry" means entry by a worker into a treated area on the agricultural establishment after a pesticide application is complete, but before any restricted-entry interval for the pesticide has expired.

"Farm" means any operation, other than a nursery or forest, engaged in the outdoor production of agricultural plants.

"Forest" means any operation engaged in the outdoor production of any agricultural plant to produce wood fiber or timber products.

"Fumigant" means any pesticide product that is a vapor or gas, or forms a vapor or gas on application, and whose method of pesticidal action is through the gaseous state.

"Greenhouse" means any operation engaged in the production of agricultural plants inside any structure or space that is enclosed with nonporous covering and that is of sufficient size to permit worker entry. This term includes, but is not limited to, polyhouses, mushroom houses, rhubarb houses, and similar structures. It does not include such structures as malls, atriums, conservatories, arboretums, or office buildings where agricultural plants are present primarily for aesthetic or climatic modification.

"Hand labor" means any agricultural activity performed by hand or with hand tools that causes a worker to have substantial contact with surfaces (such as plants, plant parts, or soil) that may contain pesticide residues. These activities include, but are not limited to, harvesting, detasseling, thinning, weeding, topping, planting, sucker removal, pruning, disbudding, roguing, and packing produce into containers in the field. Hand labor does not include operating, moving, or repairing irrigation or watering equipment or performing the tasks of crop advisors.

"Handler" means any person, including a self-employed person:

- Who is employed for any type of compensation by an agricultural establishment or commercial pesticide handling establishment to which WAC 296-307-130 applies and who is:

- Mixing, loading, transferring, or applying pesticides.
- Disposing of pesticides or pesticide containers.
- Handling opened containers of pesticides.
- Acting as a flagger.
- Cleaning, adjusting, handling, or repairing the parts of mixing, loading, or application equipment that may contain pesticide residues.
- Assisting with the application of pesticides.
- Entering a greenhouse or other enclosed area after the application and before the inhalation exposure level listed in the labeling has been reached or one of the ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling has been met:
  - ◆ To operate ventilation equipment.
  - ◆ To adjust or remove coverings used in fumigation.
  - ◆ To monitor air levels.
- Entering a treated area outdoors after application of any soil fumigant to adjust or remove soil coverings such as tarpaulins.
- Performing tasks as a crop advisor:
  - ◆ During any pesticide application.
  - ◆ Before the inhalation exposure level listed in the labeling has been reached or one of the ventilation criteria estab-

lished by WAC 296-307-12015 (3)(c) or in the labeling has been met.

◆ During any restricted-entry interval.

• The term does not include any person who is only handling pesticide containers that have been emptied or cleaned according to pesticide product labeling instructions or, in the absence of such instructions, have been subjected to triple-rinsing or its equivalent.

"Handler employer" means any person who is self-employed as a handler or who employs any handler, for any type of compensation.

"Immediate family" includes only spouse, children, stepchildren, foster children, parents, stepparents, foster parents, brothers, and sisters.

"Nursery" means any operation engaged in the outdoor production of any agricultural plant to produce cut flowers and ferns or plants that will be used in their entirety in another location. Such plants include, but are not limited to, flowering and foliage plants or trees; tree seedlings; live Christmas trees; vegetable, fruit, and ornamental transplants; and turf-grass produced for sod.

"Owner" means any person who has a present possessory interest (fee, leasehold, rental, or other) in an agricultural establishment covered by this chapter. A person who has both leased such agricultural establishment to another person and granted that same person the right and full authority to manage and govern the use of such agricultural establishment is not an owner for purposes of this part.

"Restricted-entry interval" means the time after the end of a pesticide application during which entry into the treated area is restricted.

"Substantial economic loss" means a loss in profitability greater than that which would be expected based on the experience and fluctuations of crop yields in previous years. Only losses caused by the agricultural emergency specific to the affected site and geographic area are considered. The contribution of mismanagement cannot be considered in determining the loss.

"Treated area" means any area to which a pesticide is being directed or has been directed.

"Worker" means any person, including a self-employed person, who is employed for any type of compensation and who is performing activities relating to the production of agricultural plants on an agricultural establishment to which WAC 296-307-120 applies. While persons employed by a commercial pesticide handling establishment are performing tasks as crop advisors, they are not workers covered by the requirements of WAC 296-307-120.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-11005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-11005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-11005, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-11010 General duties and prohibited actions—Worker protection standards—40 CFR, § 170.7.**

(1) General duties. The agricultural employer or the handler employer, as appropriate, shall:

(a) Assure that each worker subject to WAC 296-307-120 or each handler subject to WAC 296-307-130 receives the protections required by this part.

(b) Assure that any pesticide to which WAC 296-307-130 applies is used in a manner consistent with the labeling of the pesticide, including the requirements of this part.

(c) Provide, to each person who supervises any worker or handler, information and directions sufficient to assure that each worker or handler receives the protections required by this part. Such information and directions shall specify which persons are responsible for actions required to comply with this part.

(d) Require each person who supervises any worker or handler to assure compliance by the worker or handler with the provisions of this part and to assure that the worker or handler receives the protections required by this part.

(2) Prohibited actions. The agricultural employer or the handler employer shall not take any retaliatory action for attempts to comply with this part or any action having the effect of preventing or discouraging any worker or handler from complying or attempting to comply with any requirement of this part.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-11010, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-11010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-11010, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-11015 Violations of this part—Worker protection standards—40 CFR, § 170.9.**

(1) RCW 15.58.150 (2)(c) provides that it is unlawful for any person ". . . to use or cause to be used any pesticide contrary to label directions . . ." When 40 CFR, Part 170 is referenced on a label, users must comply with all of its requirements except those that are inconsistent with product specific instructions on the labeling. For purposes of this chapter, the term "use" is interpreted to include:

(a) Preapplication activities, including, but not limited to:

- (i) Arranging for the application of the pesticide;
- (ii) Mixing and loading the pesticide; and
- (iii) Making necessary preparations for the application of the pesticide, including responsibilities related to worker notification, training of handlers, decontamination, use and care of personal protective equipment, emergency information, and heat stress management.

(b) Application of the pesticide.

(c) Post-application activities necessary to reduce the risks of illness and injury resulting from handlers' and workers' occupational exposures to pesticide residues during the restricted-entry interval plus thirty days. These activities include, but are not limited to, responsibilities related to worker training, notification, and decontamination.

(d) Other pesticide-related activities, including, but not limited to, providing emergency assistance, transporting or storing pesticides that have been opened, and disposing of excess pesticides, spray mix, equipment wash waters, pesticide containers, and other pesticide-containing materials.

(2) A person who has a duty under this chapter, as referenced on the pesticide product label, and who fails to perform that duty, violates RCW 15.58.330 and 17.21.315, and is subject to civil penalties under RCW 15.58.335, 15.58.260 and 17.21.315.

(3) FIFRA section 14 (b)(4) provides that a person is liable for a penalty under FIFRA if another person employed by or acting for that person violates any provision of FIFRA. The term "acting for" includes both employment and contractual relationships.

(4) The requirements of this chapter, including the decontamination requirements, shall not, for the purposes of section 653 (b)(1) of Title 29 of the U.S. Code, be deemed to be the exercise of statutory authority to prescribe or enforce standards or regulations affecting the general sanitary hazards addressed by Field Sanitation, WAC 296-307-095, or other agricultural, nonpesticide hazards.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-11015, filed 12/21/04, effective 4/2/05. 97-09-013, recodified as § 296-307-11015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-11015, filed 9/30/96, effective 11/1/96.]

### Standard for Workers

**WAC 296-307-120 Applicability of this section—Standards for workers—40 CFR, § 170.102.** Requirement. Except as provided by WAC 296-307-12005 and 296-307-12010, WAC 296-307-120 applies when any pesticide product is used on an agricultural establishment in the production of agricultural plants.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-120, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-120, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-120, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12005 Exceptions—Standards for workers—40 CFR, § 170.103.** This section does not apply when any pesticide is applied on an agricultural establishment in the following circumstances:

(1) For mosquito abatement, Mediterranean fruit fly eradication, or similar wide-area public pest control programs sponsored by governmental entities.

(2) On livestock or other animals, or in or about animal premises.

(3) On plants grown for other than commercial or research purposes, which may include plants in habitations, home fruit and vegetable gardens, and home greenhouses.

(4) On plants that are in ornamental gardens, parks, and public or private lawns and grounds that are intended only for aesthetic purposes or climatic modification.

(5) By injection directly into agricultural plants. Direct injection does not include "hack and squirt," "frill and spray," chemigation, soil-incorporation, or soil-injection.

(6) In a manner not directly related to the production of agricultural plants, including, but not limited to, structural pest control, control of vegetation along rights of way and in other noncrop areas, and pasture and rangeland use.

(7) For control of vertebrate pests.

(8) As attractants or repellents in traps.

(9) On the harvested portions of agricultural plants or on harvested timber.

(10) For research uses of unregistered pesticides.

[97-09-013, recodified as § 296-307-12005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12005, filed 9/30/96, effective 11/1/96.]

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**WAC 296-307-12010 Exemptions—Standards for workers—40 CFR, § 170.104.** The workers listed in this section are exempt from the specified provisions of WAC 296-307-120.

(1) Owners of agricultural establishments.

(a) The owner of an agricultural establishment is not required to provide to himself/herself or members of his/her immediate family who are performing tasks related to the production of agricultural plants on their own agricultural establishment the protections of:

(i) WAC 296-307-12020 (3)(e) through (i);

(ii) WAC 296-307-12020 (3)(e) through (i); as referenced in WAC 296-307-12020 (4)(b)(iii) and (5);

(iii) WAC 296-307-12025;

(iv) WAC 296-307-12030;

(v) WAC 296-307-12040;

(vi) WAC 296-307-12045;

(vii) WAC 296-307-12050;

(viii) WAC 296-307-12055.

(b) The owner of the agricultural establishment must provide the protections listed in (a)(i) through (viii) of this subsection to other workers and other persons who are not members of his/her immediate family.

(2) Crop advisors.

(a) Provided that the conditions of this section are met, a person who is certified or licensed as a crop advisor by a program acknowledged as appropriate in writing by EPA or a state or tribal lead agency for pesticide enforcement, and persons performing crop advising tasks under such qualified crop advisor's direct supervision, are exempt from the provisions of:

(i) WAC 296-307-12050.

(ii) WAC 296-307-12055.

A person is under the direct supervision of a crop advisor when the crop advisor exerts the supervisory controls set out in (b)(iii) and (iv) of this subsection. Direct supervision does not require that the crop advisor be physically present at all times, but the crop advisor must be readily accessible to the employees at all times.

(b) Conditions of exemption.

(i) The certification or licensing program requires pesticide safety training that includes, at least, all the information in WAC 296-307-13025 (3)(d).

(ii) Applies only when performing crop advising tasks in the treated area.

(iii) The crop advisor must make specific determinations regarding the appropriate PPE, appropriate decontamination supplies, and how to conduct the tasks safely. The crop advisor must convey this information to each person under his direct supervision in a language that the person understands.

(iv) Before entering a treated area, the certified or licensed crop advisor must inform, through an established practice of communication, each person under his/her direct supervision of the pesticide product and active ingredient(s) applied, method of application, time of application, the restricted entry interval which tasks to undertake, and how to contact the crop advisor.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-12010, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-12010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060. 96-20-082, § 296-306A-12010, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12015 Restrictions associated with pesticide applications—Standards for workers—40 CFR, § 170.110.** (1) Farms and forests. During the application of any pesticide on a farm or in a forest, the agricultural employer shall not allow or direct any person, other than an appropriately trained and equipped handler, to enter or to remain in the treated area.

(2) Nurseries. In a nursery, during any pesticide application described in column A of Table 1 of this section, the agricultural employer shall not allow or direct any person, other than an appropriately trained and equipped handler, to enter or to remain in the area specified in column B of Table 1 of this section. After the application is completed, until the end of any restricted-entry interval, the entry-restricted area is the treated area.

Table 1.—Entry-Restricted Areas in Nurseries During Pesticide Applications

A. During Application of a Pesticide:	B. Workers are Prohibited in:
(1)(a) Applied: (i) Aerially, or (ii) In an upward direction, or (iii) Using a spray pressure greater than 150 psi, or	Treated area plus 100 feet in all directions on the nursery
(b) Applied as a: (i) Fumigant, or (ii) Smoke, or (iii) Mist, or (iv) Fog, or (v) Aerosol.	
(2)(a) Applied downward using: (i) A height of greater than 12 inches from the planting medium, or (ii) A fine spray, or (iii) A spray pressure greater than 40 psi and less than 150 psi.	Treated area plus 25 feet in all directions on the nursery
(b) Not as in 1 or 2(a) above but for which a respiratory protection device is required for application by the product labeling.	
(3) Applied otherwise. (3) Greenhouses.	Treated area (v) Eleven hours with no ventilation followed by two hours of passive ventilation; or (vi) Twenty-four hours with no ventilation. (d) The following Table 2 applies to (a), (b) and (c) of this subsection.
(a) When a pesticide application described in column A of Table 2 under (d) of this subsection takes place in a greenhouse, the agricultural employer shall not allow or direct any person, other than an appropriately trained and equipped handler, to enter or to remain in the area specified in column B of Table 2 until the time specified in column C of Table 2 has expired.	
(b) After the time specified in column C of Table 2 under (d) of this subsection has expired, until the expiration of any restricted-entry interval, the agricultural employer shall not allow or direct any worker to enter or to remain in the treated area as specified in column D of Table 2 under (d) of this subsection, except as provided in WAC 296-307-12020.	
(c) When column C of Table 2 under (d) of this subsection specifies that ventilation criteria must be met, ventilation shall continue until the air concentration is measured to be equal to or less than the inhalation exposure level the labeling requires to be achieved. If no inhalation exposure level is listed on the labeling, ventilation shall continue until after:	
(i) Ten air exchanges are completed; or	
(ii) Two hours of ventilation using fans or other mechanical ventilating systems; or	
(iii) Four hours of ventilation using vents, windows or other passive ventilation; or	
(iv) Eleven hours with no ventilation followed by one hour of mechanical ventilation; or	

Table 2.—Greenhouse Entry Restrictions Associated With Pesticide Applications

A. When a Pesticide is Applied:	B. Workers are Prohibited in:	C. Until:	D. After the Expiration of Time in Column C Until the Restricted-Entry Interval Expires, the Entry-Restricted Area is:
(1) As a fumigant	Entire greenhouse plus any adjacent structure that cannot be sealed off from the treated area	The ventilation criteria of (c) of this subsection are met	No entry restrictions after criteria in column C are met
(2) As a: (i) Smoke, or (ii) Mist, or (iii) Fog, or (iv) Aerosol	Entire enclosed area	The ventilation criteria of (c) of this subsection are met	Entire enclosed area is the treated area
(3) Not in 1 or 2 above, and for which a respiratory protection device is required for application by the product labeling	Entire enclosed area	The ventilation criteria of (c) of this subsection are met	Treated area
(4) Not in 1, 2, or 3 above, and: (i) From a height of greater than 12 in. from the planting medium, or (ii) As a fine spray, or (iii) Using a spray pressure greater than 40 psi	Treated area plus 25 feet in all directions in the enclosed area	Application is complete	Treated area
(5) Otherwise	Treated area	Application is complete	Treated area

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12015, filed 12/1/98, effective 3/1/99, 97-09-013, recodified as § 296-307-12015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-12015, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12020 Entry restrictions—Standards for workers—40 CFR, § 170.112.** (1) General restrictions.

(a) After the application of any pesticide on an agricultural establishment, the agricultural employer shall not allow or direct any worker to enter or to remain in the treated area before the restricted-entry interval specified on the pesticide labeling has expired, except as provided in this section.

(b) Entry-restricted areas in greenhouses are specified in column D in Table 2 under WAC 296-307-12015 (3)(d).

(c) When two or more pesticides are applied at the same time, the restricted-entry interval shall be the longest of the applicable intervals.

(d) The agricultural employer shall assure that any worker who enters a treated area under a restricted-entry interval as permitted by subsections (3), (4), and (5) of this section uses the personal protective equipment specified in the product labeling for early entry workers and follows any other requirements on the pesticide labeling regarding early entry.

(2) Exception for activities with no contact. A worker may enter a treated area during a restricted-entry interval if the agricultural employer assures that both of the following are met:

(a) The worker will have no contact with anything that has been treated with the pesticide to which the restricted-

entry interval applies, including, but not limited to, soil, water, air, or surfaces of plants; and

(b) No such entry is allowed until any inhalation exposure level listed in the labeling has been reached or any ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling have been met.

(3) Exception for short-term activities. A worker may enter a treated area during a restricted-entry interval for short-term activities if the agricultural employer assures that the following requirements are met:

(a) No hand labor activity is performed.

(b) The time in treated areas under a restricted-entry interval for any worker does not exceed one hour in any twenty-four-hour period.

(c) No such entry is allowed for the first four hours following the end of the application, and no such entry is allowed thereafter until any inhalation exposure level listed in the labeling has been reached or any ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling have been met.

(d) The personal protective equipment specified on the product labeling for early entry is provided to the worker. Such personal protective equipment shall conform to the following standards:

(i) Personal protective equipment (PPE) means devices and apparel that are worn to protect the body from contact

with pesticides or pesticide residues, including, but not limited to, coveralls, chemical-resistant suits, chemical-resistant gloves, chemical-resistant footwear, respiratory protection devices, chemical-resistant aprons, chemical-resistant headgear, and protective eyewear.

(ii) Long-sleeved shirts, short-sleeved shirts, long pants, short pants, shoes, socks, and other items of work clothing are not considered personal protective equipment for the purposes of this section and are not subject to the requirements of this section, although pesticide labeling may require that such work clothing be worn during some activities.

(iii) When "chemical-resistant" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of the pesticide being used through the material during use.

(iv) When "waterproof" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of water or aqueous solutions through the material during use.

(v) When a "chemical-resistant suit" is specified by the product labeling, it shall be a loose-fitting, one-piece or two-piece, chemical-resistant garment that covers, at a minimum, the entire body except head, hands, and feet.

(vi) When "coveralls" are specified by the product labeling, they shall be a loose-fitting, one-piece or two-piece garment, such as a cotton or cotton and polyester coverall, that covers, at a minimum, the entire body except head, hands, and feet. The pesticide product labeling may specify that the coveralls be worn over a layer of clothing. If a chemical-resistant suit is substituted for coveralls, it need not be worn over a layer of clothing.

(vii) Gloves shall be of the type specified by the product labeling. Gloves or glove linings made of leather, cotton, or other absorbent materials must not be worn for early entry activities unless these materials are listed on the product labeling as acceptable for such use. If chemical-resistant gloves with sufficient durability and suppleness are not obtainable for tasks with roses or other plants with sharp thorns, leather gloves may be worn over chemical-resistant liners. However, once leather gloves have been worn for this use, thereafter they shall be worn only with chemical-resistant liners and they shall not be worn for any other use.

(viii) When "chemical-resistant footwear" is specified by the product labeling, it shall be one of the following types of footwear: Chemical-resistant shoes, chemical-resistant boots, or chemical-resistant shoe coverings worn over shoes or boots. If chemical-resistant footwear with sufficient durability and a tread appropriate for wear in rough terrain is not obtainable for workers, then leather boots may be worn in such terrain.

(ix) When "protective eyewear" is specified by the product labeling, it shall be one of the following types of eyewear: Goggles; face shield; safety glasses with front, brow, and temple protection; or a full-face respirator.

(x) When "chemical-resistant headgear" is specified by the product labeling, it shall be either a chemical-resistant hood or a chemical-resistant hat with a wide brim.

(e) The agricultural employer shall assure that the worker, before entering the treated area, either has read the product labeling or has been informed, in a manner that the worker can understand, of all labeling requirements related to

human hazards or precautions, first aid, symptoms of poisoning, personal protective equipment specified for early entry, and any other labeling requirements related to safe use.

(f) The agricultural employer shall assure that:

(i) Workers wear the personal protective equipment correctly for its intended purpose and use personal protective equipment according to manufacturer's instructions.

(ii) Before each day of use, all personal protective equipment is inspected for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(iii) Personal protective equipment that cannot be cleaned properly is disposed of in accordance with any applicable federal, state, and local regulations.

(iv) All personal protective equipment is cleaned according to manufacturer's instructions or pesticide product labeling instructions before each day of reuse. In the absence of any such instructions, it shall be washed thoroughly in detergent and hot water.

(v) Before being stored, all clean personal protective equipment is dried thoroughly or is put in a well-ventilated place to dry.

(vi) Personal protective equipment contaminated with pesticides is kept separately and washed separately from any other clothing or laundry.

(vii) Any person who cleans or launders personal protective equipment is informed that such equipment may be contaminated with pesticides, of the potentially harmful effects of exposure to pesticides, and of the correct way(s) to handle and clean personal protective equipment and to protect themselves when handling equipment contaminated with pesticides.

(viii) All clean personal protective equipment is stored separately from personal clothing and apart from pesticide-contaminated areas.

(ix) Each worker is instructed how to put on, use, and remove the personal protective equipment and is informed about the importance of washing thoroughly after removing personal protective equipment.

(x) Each worker is instructed in the prevention, recognition, and first-aid treatment of heat-related illness.

(xi) Workers have a clean place(s) away from pesticide-storage and pesticide-use areas for storing personal clothing not in use; putting on personal protective equipment at the start of any exposure period; and removing personal protective equipment at the end of any exposure period.

(g) When personal protective equipment is required by the labeling of any pesticide for early entry, the agricultural employer shall assure that no worker is allowed or directed to perform the early entry activity without implementing, when appropriate, measures to prevent heat-related illness.

(h) During any early entry activity, the agricultural employer shall provide a decontamination site in accordance with WAC 296-307-12050.

(i) The agricultural employer shall not allow or direct any worker to wear home or to take home personal protective equipment contaminated with pesticides.

(4) Declaration of an agricultural emergency.

(a) The director of the Washington state department of agriculture may declare the existence of circumstances causing an agricultural emergency on a particular establishment or establishments.

(b) The director may declare an agricultural emergency based on the reasonably expected certainty of circumstances occurring based on weather or other forecasts that would create conditions that would normally be anticipated to cause an agricultural emergency.

(c) The agricultural employer may determine if the establishment under his/her control is subject to the agricultural emergency declared by the director.

(d) Emergency repair of equipment that is in use and sited within a pesticide treated area under a restricted-entry interval, such as frost protection devices, shall be considered to be an agricultural emergency. The conditions in WAC 16-228-655 shall be met.

(e) Activities that require immediate response such as fire suppression, relocation of greenhouse plants due to power failure, and similar conditions, shall be considered to be agricultural emergencies. The conditions in WAC 16-228-655 shall be met.

(5) Agricultural activities permitted under an agricultural emergency.

(a) A worker may enter a pesticide treated area under a restricted-entry interval in an agricultural emergency to perform tasks, including hand labor tasks, necessary to mitigate the effects of the agricultural emergency if the agricultural employer assures that all the following requirements are met:

(i) No entry is permitted for the first four hours after the pesticide application or the minimum reentry interval allowed by EPA for that product, whichever is less;

(ii) The personal protective equipment specified on the product labeling for early entry is provided to the worker;

(iii) The agricultural employer shall assure that the worker, before entering the treated area, either has read the product labeling or has been informed, in a manner the worker can understand, of all labeling requirements related to human hazards or precautions, first aid, symptoms of poisoning, personal protective equipment specified for early entry, and any other labeling requirements related to safe use;

(iv) The agricultural employer shall assure that the worker wears the proper PPE and that the PPE is in operable condition and that the worker has been trained in its proper use;

(v) The agricultural employer shall assure that measures have been taken, when appropriate, to prevent heat-related illness;

(vi) A decontamination site has been provided in accordance with EPA regulations;

(vii) The agricultural employer shall not allow or direct any worker to wear home or take home personal protective equipment contaminated with pesticides.

(b) If the agricultural emergency is due to equipment failure, then the agricultural employer shall assure that all the requirements in subsection (1) of this section are met plus the following additional requirement. The only permitted activity until the restricted-entry interval has elapsed is equipment repair that would mitigate the effect of the equipment failure.

(6) Recordkeeping required for agricultural emergencies.

(a) If the employer declares that his/her establishment is affected by an agricultural emergency and that activities regulated by the worker protection standard have been per-

formed, the employer shall keep the following records for seven years from the date of the agricultural emergency:

(i) Date of the agricultural emergency;

(ii) Time of the agricultural emergency, start and end;

(iii) Reason for the agricultural emergency, such as frost, fire, equipment failure, etc.;

(iv) Crop/site;

(v) Pesticide(s) - name, EPA number, REI;

(vi) Name, date, time of entry and exit of early entry person(s);

(vii) Estimated potential of economic loss which would have occurred had no early entry been allowed.

(b) Records shall be completed within twenty-four hours of the early entry exposure and be available to the department and/or department of health and/or medical facility or treating physician if requested by the above or the employee.

(7) Exception to entry restrictions requiring EPA approval. EPA may in accordance with 40 CFR, Part 170.112(e) grant an exception from the requirements of this section. A request for an exception must be submitted to the Director, Office of Pesticide Programs (H-7501C), Environmental Protection Agency, 401 "M" Street SW, Washington, DC 20460 and must be accompanied by two copies of the information specified in 40 CFR, Part 170.112(e).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12020, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-12020, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12020, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12025 Notice of applications—Standards for workers—40 CFR, § 170.120.** (1) Notification to workers of pesticide applications in greenhouses. The agricultural employer shall notify workers of any pesticide application in the greenhouse in accordance with this subsection.

(a) All pesticide applications shall be posted in accordance with subsection (3) of this section.

(b) If the pesticide product labeling has a statement requiring both the posting of treated areas and oral notification to workers, the agricultural employer shall also provide oral notification of the application to the worker in accordance with subsection (4) of this section.

(c) Notice need not be given to a worker if the agricultural employer can assure that one of the following is met:

(i) From the start of the application until the end of the application and during any restricted-entry interval, the worker will not enter, work in, remain in, or pass through the greenhouse; or

(ii) The worker applied (or supervised the application of) the pesticide for which the notice is intended and is aware of all information required by subsection (4)(a) through (c) of this section.

(2) Notification to workers on farms, in nurseries, or in forests of pesticide applications. The agricultural employer shall notify workers of any pesticide application on the farm or in the nursery or forest in accordance with this subsection.

(a) If the pesticide product labeling has a statement requiring both the posting of treated areas and oral notification to workers, the agricultural employer shall post signs in accordance with subsection (3) of this section and shall pro-

vide oral notification of the application to the worker in accordance with subsection (4) of this section.

(b) For any pesticide other than those for which the labeling requires both posting and oral notification of applications, the agricultural employer shall give notice of the application to the worker either by the posting of warning signs in accordance with subsection (3) of this section or orally in accordance with subsection (4) of this section, and shall inform the workers as to which method of notification is in effect.

(c) Notice need not be given to a worker if the agricultural employer can assure that one of the following is met:

(i) From the start of the application until the end of the application and during any restricted-entry interval, the worker will not enter, work in, remain in, or pass through on foot the treated area or any area within one-quarter mile of the treated area; or

(ii) The worker applied (or supervised the application of) the pesticide for which the notice is intended and is aware of all information required by subsection (4)(a) through (c) of this section.

(3) Posted warning signs. The agricultural employer shall post warning signs in accordance with the following criteria:

(a) The warning sign shall have a background color that contrasts with red. The words "DANGER" and "PELIGRO," plus "PESTICIDES" and "PESTICIDAS," shall be at the top of the sign, and the words "KEEP OUT" and "NO ENTRE" shall be at the bottom of the sign. Letters for all words must be clearly legible. A circle containing an upraised hand on the left and a stern face on the right must be near the center of the sign. The inside of the circle must be red, except that the hand and a large portion of the face must be in a shade that contrasts with red. The length of the hand must be at least twice the height of the smallest letters. The length of the face must be only slightly smaller than the hand. Additional information such as the name of the pesticide and the date of application may appear on the warning sign if it does not detract from the appearance of the sign or change the meaning of the required information. A black and white example of a warning sign meeting these requirements, other than the size requirements, follows:



(b) The standard sign shall be at least fourteen inches by sixteen inches with letters at least one inch in height. Farms and forests shall use the standard size sign unless a smaller sign is necessary because the treated area is too small to accommodate a sign of this size. In nurseries and greenhouses, the agricultural employer may, at any time, use a sign smaller than the standard size sign. Whenever a small sign is used on any establishment, there are specific posting distances depending on the size of the lettering and symbol on the sign. If a sign is used with DANGER and PELIGRO in letters at least 7/8 inch in height and the remaining letters at least 1/2 inch and a red circle at least three inches in diameter containing an upraised hand and a stern face, the signs shall be no further than fifty feet apart. If a sign is used with DANGER and PELIGRO in letters at least 7/16 inch in height and the remaining letters at least 1/4 inch in height and a red circle at least 1 1/2 inches in diameter containing an upraised hand and stern face, the signs shall be no further than twenty-five feet apart. A sign with DANGER and PELIGRO in letters less than 7/16 inch in height or with any words in letters less than 1/4 inch in height, or a red circle smaller than 1 1/2 inches in diameter containing an upraised hand and a stern face will not satisfy the requirements of the rule. All signs must meet the requirements of (a) of this subsection.

(c) The employer may replace the Spanish portion of the warning sign with a non-English language read by the largest group of workers who do not read English. The replacement sign must be in the same format as the original sign and must be visible and legible.

(d) On farms and in forests and nurseries, the signs shall be visible from all usual points of worker entry to the treated area, including at least each access road, each border with any labor camp adjacent to the treated area, and each footpath and other walking route that enters the treated area. When there are no usual points of worker entry, signs shall be posted in the corners of the treated area or in any other location affording maximum visibility.

(e) In greenhouses, the signs shall be posted so they are visible from all usual points of worker entry to the treated area including each aisle or other walking route that enters the treated area. When there are no usual points of worker entry to the treated area, signs shall be posted in the corners of the treated area or in any other location affording maximum visibility.

(f) The signs shall:

(i) Be posted no sooner than twenty-four hours before the scheduled application of the pesticide.

(ii) Remain posted throughout the application and any restricted-entry interval.

(iii) Be removed within three days after the end of the application and any restricted-entry interval and before agricultural-worker entry is permitted, other than entry permitted by WAC 296-307-12020.

(g) The signs shall remain visible and legible during the time they are posted.

(h) When several contiguous areas are to be treated with pesticides on a rotating or sequential basis, the entire area may be posted. Worker entry, other than entry permitted by WAC 296-307-12020, is prohibited for the entire area while the signs are posted.

(4) Oral warnings. The agricultural employer shall provide oral warnings to workers in a manner that the worker can understand. If a worker will be on the premises during the application, the warning shall be given before the application takes place. Otherwise, the warning shall be given at the beginning of the worker's first work period during which the application is taking place or the restricted-entry interval for the pesticide is in effect. The warning shall consist of:

- (a) The location and description of the treated area.
- (b) The time during which entry is restricted.
- (c) Instructions not to enter the treated area until the restricted-entry interval has expired.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12025, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-12025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12025, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12030 Providing specific information about applications—Standards for workers—40 CFR, § 170.122.** When workers are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the agricultural employer shall display, in accordance with this section, specific information about the pesticide.

(1) Location, accessibility, and legibility. The information shall be displayed in the location specified for the pesticide safety poster in WAC 296-307-12045(4) and shall be accessible and legible, as specified in WAC 296-307-12045 (4) and (6).

(2) Timing.

(a) If warning signs are posted for the treated area before an application, the specific application information for that application shall be posted at the same time or earlier.

(b) The information shall be posted before the application takes place, if workers will be on the establishment during application. Otherwise, the information shall be posted at the beginning of any worker's first work period.

(c) The information shall continue to be displayed for at least thirty days after the end of the restricted-entry interval (or, if there is no restricted-entry interval, for at least thirty days after the end of the application) or at least until workers are no longer on the establishment, whichever is earlier.

(3) Required information. The information shall include:

- (a) The location and description of the treated area.
- (b) The product name, EPA registration number, and active ingredient(s) of the pesticide.
- (c) The time and date the pesticide is to be applied.
- (d) The restricted-entry interval for the pesticide.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12030, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-12030, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12030, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12035 Notice of applications to handler employers—Standards for workers—40 CFR, § 170.124.** Whenever handlers who are employed by a commercial pesticide handling establishment will be performing pesticide handling tasks on an agricultural establishment, the agricultural employer shall provide to the handler employer,

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or assure that the handler employer is aware of, the following information concerning any areas on the agricultural establishment that the handler may be in (or may walk within one-quarter mile of) and that may be treated with a pesticide or that may be under a restricted-entry interval while the handler will be on the agricultural establishment:

- (1) Specific location and description of any such areas; and
- (2) Restrictions on entering those areas.

[97-09-013, recodified as § 296-307-12035, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-08, § 296-306A-12035, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12040 Pesticide safety training—Standards for workers—40 CFR, § 170.130.** (1) General requirement.

(a) Agricultural employer assurance. The agricultural employer shall assure that each worker, required by this section to be trained, has been trained according to this section during the last five years, counting from the end of the month in which the training was completed.

*Note: In addition to the training required by this section, the agricultural employer shall assure without exception, that all employees are trained in accordance with WAC 296-307-550, Employer chemical hazard communication.*

(b) Requirement for workers performing early entry activities. Before a worker enters a treated area on the agricultural establishment during a restricted-entry interval to perform early entry activities permitted by WAC 296-307-12020 and contacts anything that has been treated with the pesticide to which the restricted-entry interval applies, including but not limited to, soil, water, or surfaces of plants, the agricultural employer shall assure that the worker has been trained.

(c) Requirements for other agricultural workers.

(i) Information before entry. Except as provided in (b) of this subsection, before a worker enters any areas on the agricultural establishment where, within the last thirty days a pesticide to which this part applies has been applied or the restricted-entry interval for such pesticide has been in effect, the agricultural employer shall assure that the worker has been provided the pesticide safety information specified in subsection (3) of this section, in a manner that agricultural workers can understand, such as by providing written materials or oral communication or by other means. The agricultural employer must be able to verify compliance with this requirement.

(ii) Training before the start of a work period. The agricultural employer shall assure that a worker has been trained before the worker enters any areas on the agricultural establishment where, within the last thirty days a pesticide to which this chapter applies has been applied or a restricted-entry interval for such pesticide has been in effect, the agricultural employer shall assure that the worker has been trained.

(2) Exceptions. The following persons need not be trained under this section:

- (a) A worker who is currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW.
- (b) A worker who satisfies the training requirements of chapter 17.21 RCW.

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(c) A worker who satisfies the handler training requirements of WAC 296-307-13025(3).

(d) A worker who is certified or licensed as a crop advisor by the Washington state department of agriculture under RCW 15.58.230: Provided, That a requirement for such certification or licensing is pesticide safety training that includes all the information set out in WAC 296-307-13025 (3)(d).

(3) Training programs.

(a) General pesticide safety information shall be presented to workers either orally from written materials or audiovisually. The information must be presented in a manner that the workers can understand (such as through a translator) using nontechnical terms. The presenter also shall respond to workers' questions.

(b) The person who conducts the training shall meet at least one of the following criteria:

(i) Be currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW; or

(ii) Be currently designated as a trainer of certified applicators or pesticide handlers by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW; or

(iii) Have completed a pesticide safety train-the-trainer program approved by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW; or

(iv) Satisfy the training requirements in WAC 296-307-13025(3).

(c) Any person who issues a Washington state department of agriculture-approved Worker Protection Standard worker training card must assure that the worker who receives the training card has been trained in accordance with subsection (4)(d) of this section.

(d) The training materials shall convey, at a minimum, the following information:

(i) Where and in what form pesticides may be encountered during work activities.

(ii) Hazards of pesticides resulting from toxicity and exposure, including acute and chronic effects, delayed effects, and sensitization.

(iii) Routes through which pesticides can enter the body, including information on wearing work clothing that protects the body from pesticide residues.

(iv) Signs and symptoms of common types of pesticide poisoning.

(v) Emergency first aid for pesticide injuries or poisonings.

(vi) How to obtain emergency medical care.

(vii) Routine and emergency decontamination procedures, including preventing pesticides from entering the body by:

- Emergency eyeflushing techniques;
- Washing work clothes separately from other clothes before wearing them again;
- Washing before eating, drinking, using chewing gum or tobacco, or using the toilet;
- Washing/showering with soap and water, shampooing hair, and putting on clean clothes after work; and
- Washing immediately in the nearest clean water if pesticides are spilled on the body. As soon as possible shower, shampoo, and change into clean clothes.

(viii) Hazards from chemigation and drift.

(ix) Hazards from pesticide residues on clothing.

(x) Warnings about taking pesticides or pesticide containers home.

(xi) Requirements of this part designed to reduce the risks of illness or injury resulting from workers' occupational exposure to pesticides, including application and entry restrictions, the design of the warning sign, posting of warning signs, oral warnings, the availability of specific information about applications, and the protection against retaliatory acts.

(4) Verification of training.

(a) Except as provided in subsection (4)(b) of this section, if the agricultural employer assures that a worker possesses a Washington state department of agriculture-approved Worker Protection Standard worker training card, then the requirements of subsection (1) of this section will have been met.

(b) If the agricultural employer is aware or has reason to know that a Washington state department of agriculture-approved Worker Protection Standard worker training card has not been issued in accordance with this section, or has not been issued to the worker bearing the card, or the training was completed more than five years before the beginning of the current month, a worker's possession of that certificate does not meet the requirements of subsection (1) of this section.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-12040, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-12040, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-12040, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-20-082, § 296-306A-12040, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12045 Posted pesticide safety information—Standards for workers—40 CFR, § 170.135.** (1) Requirement. When workers are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the agricultural employer shall display, in accordance with this section, pesticide safety information.

(2) Pesticide safety poster. A safety poster must be displayed that conveys, at a minimum, the following basic pesticide safety concepts:

(a) Help keep pesticides from entering your body. At a minimum, the following points shall be conveyed:

(i) Avoid getting on your skin or into your body any pesticides that may be on plants and soil, in irrigation water, or drifting from nearby applications.

(ii) Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.

(iii) Wear work clothing that protects the body from pesticide residues (long-sleeved shirts, long pants, shoes and socks, and a hat or scarf).

(iv) Wash/shower with soap and water, shampoo hair, and put on clean clothes after work.

(v) Wash work clothes separately from other clothes before wearing them again.

(vi) Wash immediately in the nearest clean water if pesticides are spilled or sprayed on the body. As soon as possible, shower, shampoo, and change into clean clothes.

(vii) Follow directions about keeping out of treated or restricted areas.

(b) There are federal rules to protect workers and handlers, including a requirement for safety training.

(3) Emergency medical care information.

(a) The name, address, and telephone number of the nearest emergency medical care facility shall be on the safety poster or displayed close to the safety poster.

(b) The agricultural employer shall inform workers promptly of any change to the information on emergency medical care facilities.

(4) Location.

(a) The information shall be displayed in a central location on the farm or in the nursery or greenhouse where it can be readily seen and read by workers.

(b) The information shall be displayed in a location in or near the forest in a place where it can be readily seen and read by workers and where workers are likely to congregate or pass by, such as at a decontamination site or an equipment storage site.

(5) Accessibility. Workers shall be informed of the location of the information and shall be allowed access to it.

(6) Legibility. The information shall remain legible during the time it is posted.

[97-09-013, recodified as § 296-307-12045, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12045, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12050 Decontamination—Standards for workers—40 CFR, § 170.150.** (1) Requirements. The agricultural employer must provide decontamination supplies for workers in accordance with this section whenever:

(a) Any worker on the agricultural establishment is performing an activity in the area where a pesticide was applied or a restricted-entry interval (REI) was in effect within the last thirty days; and

(b) The worker contacts anything that has been treated with the pesticide including but not limited to soil, water, plants, plant surfaces, and plant parts;

(c) *Exception.* The thirty-day time period established in (a) of this subsection shall not apply if the only pesticides used in the treated area are products with an REI of four hours or less on the label (but not a product without an REI on the label). When workers are in such treated areas, the agricultural employer shall provide decontamination supplies for not less than seven days following the expiration of any applicable REI.

(2) General conditions.

(a) The agricultural employer shall provide workers with adequate water for routine washing and emergency eyeflushing. At all times when the water is available to workers, the employer shall assure that it is of a quality and temperature that will not cause illness or injury when it contacts the skin or eyes or if it is swallowed.

(b) When water stored in a tank is to be used for mixing pesticides, it shall not be used for decontamination or eyeflushing, unless the tank is equipped with properly functioning valves or other mechanisms that prevent movement of pesticides into the tank.

(c) The agricultural employer shall provide soap and single-use towels in quantities sufficient to meet workers' needs.

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(d) To provide for emergency eyeflushing, the agricultural employer shall assure that at least one pint of water is immediately available to each worker who is performing early entry activities permitted by WAC 296-307-12020 and for which the pesticide labeling requires protective eyewear. The eyeflush water shall be carried by the early entry worker, or shall be on the vehicle the early entry worker is using, or shall be otherwise immediately accessible.

(3) Location.

(a) The decontamination supplies shall be located together and shall be reasonably accessible to and not more than one-quarter mile from where workers are working.

(b) For worker activities performed more than one-quarter mile from the nearest place of vehicular access:

(i) The soap, single-use towels, and water may be at the nearest place of vehicular access.

(ii) The agricultural employer may permit workers to use clean water from springs, streams, lakes, or other sources for decontamination at the remote work site, if such water is more accessible than the water located at the nearest place of vehicular access.

(c) The decontamination supplies shall not be in an area being treated with pesticides.

(d) The decontamination supplies shall not be maintained in an area that is under a restricted-entry interval, unless the workers for whom the decontamination supplies are provided are performing early entry activities permitted by WAC 296-307-12020 and involving contact with treated surfaces and the decontamination supplies would otherwise not be reasonably accessible to those workers.

(4) Decontamination after early entry activities. At the end of any exposure period for workers engaged in early entry activities permitted by WAC 296-307-12020 and involving contact with anything that has been treated with the pesticide to which the restricted-entry interval applies, including, but not limited to, soil, water, air, or surfaces of plants, the agricultural employer shall provide, at the site where the workers remove personal protective equipment, soap, clean towels, and an adequate amount of water so that the workers may wash thoroughly. At least ten gallons of water for one employee and twenty gallons of water for two or more employees shall be provided at early entry sites that do not have running water.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-12050, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-12050, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12050, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-12055 Emergency assistance—Standards for workers—40 CFR, § 170.160.** If there is reason to believe that a person who is or has been employed on an agricultural establishment to perform tasks related to the production of agricultural plants has been poisoned or injured by exposure to pesticides used on the agricultural establishment, including, but not limited to, exposures from application, splash, spill, drift, or pesticide residues, the agricultural employer shall:

(1) Make available to that person prompt transportation from the agricultural establishment, including any labor

camp on the agricultural establishment, to an appropriate emergency medical facility.

(2) Provide to that person or to treating medical personnel, promptly upon request, any obtainable information on:

(a) Product name, EPA registration number, and active ingredients of any product to which that person might have been exposed.

(b) Antidote, first-aid, and other medical information from the product labeling.

(c) The circumstances of application or use of the pesticide on the agricultural establishment.

(d) The circumstances of exposure of that person to the pesticide.

[97-09-013, recodified as § 296-307-12055, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12055, filed 9/30/96, effective 11/1/96.]

### Standard for Pesticide Handlers

**WAC 296-307-130 Applicability of this section—Standards for pesticide handlers—40 CFR, § 170.202.** (1) Requirement. Except as provided by subsection (2) of this section, WAC 296-307-130 applies when any pesticide is handled for use on an agricultural establishment.

(2) Exceptions. WAC 296-307-130 does not apply when any pesticide is handled for use on an agricultural establishment in the following circumstances:

(a) For mosquito abatement, Mediterranean fruit fly eradication, or similar wide-area public pest control programs sponsored by governmental entities.

(b) On livestock or other animals, or in or about animal premises.

(c) On plants grown for other than commercial or research purposes, which may include plants in habitations, home fruit and vegetable gardens, and home greenhouses.

(d) On plants that are in ornamental gardens, parks, and public or private lawns and grounds and that are intended only for aesthetic purposes or climatic modification.

(e) In a manner not directly related to the production of agricultural plants, including, but not limited to, structural pest control, control of vegetation along rights of way and in other noncrop areas, and pasture and rangeland use.

(f) For control of vertebrate pests.

(g) As attractants or repellents in traps.

(h) On the harvested portions of agricultural plants or on harvested timber.

(i) For research uses of unregistered pesticides.

(j) Exemptions. Except as provided by WAC 296-307-130 and 296-307-13005, WAC 296-307-130 applies when a pesticide is handled for an agricultural establishment.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-130, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-130, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-130, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13005 Exemptions—Standards for handlers—40 CFR, § 170.204.** The handlers listed in this section are exempt from the specified provisions of this part.

(1) Owners of agricultural establishments.

(a) The owner of an agricultural establishment is not required to provide to himself or members of his immediate family who are performing handling tasks on their own agricultural establishment the protections of:

(i) WAC 296-307-13010 (2) and (3).

(ii) WAC 296-307-13015.

(iii) WAC 296-307-13025.

(iv) WAC 296-307-13030.

(v) WAC 296-307-13035.

(vi) WAC 296-307-13040.

(vii) WAC 296-307-13045 (5) through (7).

(viii) WAC 296-307-13050.

(ix) WAC 296-307-13055.

(b) The owner of the agricultural establishment must provide the protections listed in subsection (1)(a)(i) through (ix) of this section to other handlers and other persons who are not members of his immediate family.

(2) Crop advisors.

(a) Provided that the conditions of (b) of this subsection are met, a person who is certified or licensed as a crop advisor by the Washington state department of agriculture under RCW 15.58.230, and persons performing crop advising tasks under such qualified crop advisor's direct supervision, are exempt from the provisions of:

(i) WAC 296-307-13030.

(ii) WAC 296-307-13045.

(iii) WAC 296-307-13050.

(iv) WAC 296-307-13055.

A person is under the direct supervision of a crop advisor when the crop advisor exerts the supervisory controls set out in (b)(iv) and (v) of this subsection. Direct supervision does not require that the crop advisor be physically present at all times, but the crop advisor must be readily accessible to the employees at all times.

(b) Conditions of exemption.

(i) The certification or licensing program requires pesticide safety training that includes, at least, all the information in WAC 296-307-13025 (3)(d).

(ii) No entry into the treated area occurs until after application ends.

(iii) Applies only when performing crop advising tasks in the treated area.

(iv) The crop advisor must make specific determinations regarding the appropriate PPE, appropriate decontamination supplies, and how to conduct the tasks safely. The crop advisor must convey this information to each person under his direct supervision in a language that the person understands.

(v) Before entering a treated area, the certified or licensed crop advisor must inform, through an established practice of communication, each person under his direct supervision of the pesticide products and active ingredient(s) applied, method of application, time of application, the restricted-entry interval, which tasks to undertake, and how to contact the crop advisor.

(c) Applies only when the persons are performing crop advising tasks in the treated area.

(d) The crop advisor must make specific determinations regarding the appropriate PPE, appropriate decontamination supplies, and how to conduct the tasks safely. The crop advisor must convey this information to each person under his direct supervision in a language that the person understands.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-13005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-13005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13005, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13010 Restrictions during applications—Standards for pesticide handlers—40 CFR, § 170.210.** (1) Contact with workers and other persons. The handler employer and the handler shall assure that no pesticide is applied so as to contact, either directly or through drift, any worker or other person, other than an appropriately trained and equipped handler.

(2) Handlers handling highly toxic pesticides. The handler employer shall assure that any handler who is performing any handling activity with a product that has the skull and crossbones symbol on the front panel of the label is monitored visually or by voice communication at least every two hours.

(3) Fumigant applications in greenhouses. The handler employer shall assure:

(a) That any handler who handles a fumigant in a greenhouse, including a handler who enters the greenhouse before the acceptable inhalation exposure level or ventilation criteria have been met to monitor air levels or to initiate ventilation, maintains continuous visual or voice contact with another handler.

(b) That the other handler has immediate access to the personal protective equipment required by the fumigant labeling for handlers in the event entry into the fumigated greenhouse becomes necessary for rescue.

[97-09-013, recodified as § 296-307-13010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13010, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13015 Providing specific information about applications—Standards for pesticide handlers—40 CFR, § 170.222.** When handlers (except those employed by a commercial pesticide handling establishment) are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the handler employer shall display, in accordance with this section, specific information about the pesticide.

(1) Location, accessibility, and legibility. The information shall be displayed in the same location specified for the pesticide safety poster in WAC 296-307-13040(4) and shall be accessible and legible, as specified in WAC 296-307-13040 (5) and (6).

(2) Timing.

(a) If warning signs are posted for the treated area before an application, the specific application information for that application shall be posted at the same time or earlier.

(b) The information shall be posted before the application takes place, if handlers (except those employed by a commercial pesticide handling establishment) will be on the establishment during application. Otherwise, the information shall be posted at the beginning of any such handler's first work period.

(c) The information shall continue to be displayed for at least thirty days after the end of the restricted-entry interval (or, if there is no restricted-entry interval, for at least thirty

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days after the end of the application) or at least until the handlers are no longer on the establishment, whichever is earlier.

(3) Required information. The information shall include:

(a) The location and description of the treated area.

(b) The product name, EPA registration number, and active ingredient(s) of the pesticide.

(c) The time and date the pesticide is to be applied.

(d) The restricted-entry interval for the pesticide.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-13015, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-13015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13015, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13020 Notice of applications to agricultural employers—Standards for pesticide handlers—40 CFR, § 170.224.** Before the application of any pesticide on or in an agricultural establishment, the handler employer shall provide the following information to any agricultural employer for the establishment or shall assure that any agricultural employer is aware of:

(1) Specific location and description of the treated area.

(2) Time and date of application.

(3) Product name, EPA registration number, and active ingredient(s).

(4) Restricted-entry interval.

(5) Whether posting and oral notification are required.

(6) Any other product-specific requirements on the product labeling concerning protection of workers or other persons during or after application.

[97-09-013, recodified as § 296-307-13020, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13020, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13025 Pesticide safety training—Standards for pesticide handlers—40 CFR, § 170.230.** (1) Requirement. Before any handler performs any handling task, the handler employer shall assure that the handler has been trained in accordance with this section during the last five years, counting from the end of the month in which the training was completed.

*Note:* In addition to the training required by this section, the agricultural employer shall assure, without exception, that all employees are trained in accordance with WAC 296-307-550, Employer chemical hazard communication.

(2) Exceptions. The following persons need not be trained under this section:

(a) A handler who is currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW.

(b) A handler who is certified or licensed as a crop advisor by the Washington state department of agriculture under RCW 15.58.230: Provided, That a requirement for such certification or licensing is pesticide safety training that includes all the information set out in WAC 296-307-13025 (3)(d).

(3) Training programs.

(a) General pesticide safety information shall be presented to handlers either orally from written materials or audiovisually. The information must be presented in a manner that the handlers can understand (such as through a translator). The presenter also shall respond to handlers' questions.

(b) The person who conducts the training shall meet at least one of the following criteria:

(i) Be currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW; or

(ii) Be currently designated as a trainer of certified applicators or pesticide handlers by the Washington state department of agriculture under chapters 15.58 or 17.21 RCW; or

(iii) Have completed a pesticide safety train-the-trainer program approved by a state, federal, or tribal agency having jurisdiction.

(c) Any person who issues a Washington state department of agriculture-approved worker protection standard handler training card must assure that the handler who receives the training card has been trained in accordance with (d) of this subsection.

(d) The pesticide safety training materials must convey, at a minimum, the following information:

(i) Format and meaning of information contained on pesticide labels and in labeling, including safety information such as precautionary statements about human health hazards.

(ii) Hazards of pesticides resulting from toxicity and exposure, including acute and chronic effects, delayed effects, and sensitization.

(iii) Routes by which pesticides can enter the body.

(iv) Signs and symptoms of common types of pesticide poisoning.

(v) Emergency first aid for pesticide injuries or poisonings.

(vi) How to obtain emergency medical care.

(vii) Routine and emergency decontamination procedures.

(viii) Need for and appropriate use of personal protective equipment.

(ix) Prevention, recognition, and first-aid treatment of heat-related illness.

(x) Safety requirements for handling, transporting, storing, and disposing of pesticides, including general procedures for spill cleanup.

(xi) Environmental concerns such as drift, runoff, and wildlife hazards.

(xii) Warnings about taking pesticides or pesticide containers home.

(xiii) Requirements of this part that must be followed by handler employers for the protection of handlers and other persons, including the prohibition against applying pesticides in a manner that will cause contact with workers or other persons, the requirement to use personal protective equipment, the provisions for training and decontamination, and the protection against retaliatory acts.

(4) Verification of training.

(a) Except as provided in (b) of this subsection, if the handler employer assures that a handler possesses a Washington state department of agriculture-approved worker protection standard handler training card, then the requirements of subsection (1) of this section will have been met.

(b) If the handler employer is aware or has reason to know that a Washington state department of agriculture-approved worker protection standard handler training card has not been issued in accordance with this section, or has not been issued to the handler bearing the card, or the handler

training was completed more than five years before the beginning of the current month, a handler's possession of that card does not meet the requirements of subsection (1) of this section.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-13025, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-13025, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-13025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-20-082, § 296-306A-13025, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13030 Knowledge of labeling and site-specific information—Standards for pesticide handlers—40 CFR, § 170.232.** (1) Knowledge of labeling information.

(a) The handler employer shall assure that before the handler performs any handling activity, the handler either has read the product labeling or has been informed in a manner the handler can understand of all labeling requirements related to safe use of the pesticide, such as signal words, human hazard precautions, personal protective equipment requirements, first-aid instructions, environmental precautions, and any additional precautions pertaining to the handling activity to be performed.

(b) The handler employer shall assure that the handler has access to the product labeling information during handling activities.

(2) Knowledge of site-specific information. Whenever a handler who is employed by a commercial pesticide handling establishment will be performing pesticide handling tasks on an agricultural establishment, the handler employer shall assure that the handler is aware of the following information concerning any areas on the agricultural establishment that the handler may be in (or may walk within one-quarter mile of) and that may be treated with a pesticide or that may be under a restricted-entry interval while the handler will be on the agricultural establishment:

(a) Specific location and description of any such areas; and

(b) Restrictions on entering those areas.

[97-09-013, recodified as § 296-307-13030, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-20-082, § 296-306A-13030, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13035 Safe operation of equipment—Standards for pesticide handlers—40 CFR, § 170.234.** (1)

The handler employer shall assure that before the handler uses any equipment for mixing, loading, transferring, or applying pesticides, the handler is instructed in the safe operation of such equipment, including, when relevant, chemigation safety requirements and drift avoidance.

(2) The handler employer shall assure that, before each day of use, equipment used for mixing, loading, transferring, or applying pesticides is inspected for leaks, clogging, and worn or damaged parts, and any damaged equipment is repaired or is replaced.

(3) Before allowing any person to repair, clean, or adjust equipment that has been used to mix, load, transfer, or apply pesticides, the handler employer shall assure that pesticide residues have been removed from the equipment, unless the person doing the cleaning, repairing, or adjusting is a handler employed by the agricultural or commercial pesticide handling establishment. If pesticide residue removal is not feasi-

ble, the handler employer shall assure that the person who repairs, cleans, or adjusts such equipment is informed:

- (a) That such equipment may be contaminated with pesticides.
- (b) Of the potentially harmful effects of exposure to pesticides.
- (c) Of the correct way to handle such equipment.

[97-09-013, recodified as § 296-307-13035, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13035, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13040 Posted pesticide safety information—Standards for pesticide handlers—40 CFR, § 170.235.** (1) Requirement. When handlers (except those employed by a commercial pesticide handling establishment) are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the handler employer shall display, in accordance with this section, pesticide safety information.

(2) Pesticide safety poster. A safety poster must be displayed that conveys, at a minimum, the following basic pesticide safety concepts:

(a) Help keep pesticides from entering your body. At a minimum, the following points shall be conveyed:

(i) Avoid getting on your skin or into your body any pesticides that may be on plants and soil, in irrigation water, or drifting from nearby applications.

(ii) Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.

(iii) Wear work clothing that protects the body from pesticide residues (long-sleeved shirts, long pants, shoes and socks, and a hat or scarf).

(iv) Wash/shower with soap and water, shampoo hair, and put on clean clothes after work.

(v) Wash work clothes separately from other clothes before wearing them again.

(vi) Wash immediately in the nearest clean water if pesticides are spilled or sprayed on the body. As soon as possible, shower, shampoo, and change into clean clothes.

(vii) Follow directions about keeping out of treated or restricted areas.

(b) There are federal rules to protect workers and handlers including a requirement for safety training.

(3) Emergency medical care information.

(a) The name, address, and telephone number of the nearest emergency medical care facility shall be on the safety poster or displayed close to the safety poster.

(b) The handler employer shall inform handlers promptly of any change to the information on emergency medical care facilities.

(4) Location.

(a) The information shall be displayed in a central location on the farm or in the nursery or greenhouse where it can be readily seen and read by handlers.

(b) The information shall be displayed in a location in or near the forest in a place where it can be readily seen and read by handlers and where handlers are likely to congregate or pass by, such as at a decontamination site or an equipment storage site.

(5) Accessibility. Handlers shall be informed of the location of the information and shall be allowed access to it.

(6) Legibility. The information shall remain legible during the time it is posted.

[97-09-013, recodified as § 296-307-13040, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13040, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13045 Personal protective equipment—Standards for pesticide handlers—40 CFR, § 170.240.** (1) Requirement. Any person who performs tasks as a pesticide handler shall use the clothing and personal protective equipment specified on the labeling for use of the product.

(2) Definition.

(a) Personal protective equipment (PPE) means devices and apparel that are worn to protect the body from contact with pesticides or pesticide residues, including, but not limited to, coveralls, chemical-resistant suits, chemical-resistant gloves, chemical-resistant footwear, respiratory protection devices, chemical-resistant aprons, chemical-resistant headgear, and protective eyewear.

(b) Long-sleeved shirts, short-sleeved shirts, long pants, short pants, shoes, socks, and other items of work clothing are not considered personal protective equipment for the purposes of this section and are not subject to the requirements of this section, although pesticide labeling may require that such work clothing be worn during some activities.

(3) Provision. When personal protective equipment is specified by the labeling of any pesticide for any handling activity, the handler employer shall provide the appropriate personal protective equipment in clean and operating condition to the handler.

(a) When "chemical-resistant" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of the pesticide being used through the material during use.

(b) When "waterproof" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of water or aqueous solutions through the material during use.

(c) When a "chemical-resistant suit" is specified by the product labeling, it shall be a loose-fitting, one-piece or two-piece chemical-resistant garment that covers, at a minimum, the entire body except head, hands, and feet.

(d) When "coveralls" are specified by the product labeling, they shall be a loose-fitting, one-piece or two-piece garment, such as a cotton or cotton and polyester coverall, that covers, at a minimum, the entire body except head, hands, and feet. The pesticide product labeling may specify that the coveralls be worn over another layer of clothing.

(e) Gloves shall be of the type specified by the product labeling. Gloves or glove linings made of leather, cotton, or other absorbent material shall not be worn for handling activities unless such materials are listed on the product labeling as acceptable for such use.

(f) When "chemical-resistant footwear" is specified by the product labeling, one of the following types of footwear must be worn:

(i) Chemical-resistant shoes.

(ii) Chemical-resistant boots.

(iii) Chemical-resistant shoe coverings worn over shoes or boots.

(g) When "protective eyewear" is specified by the product labeling, one of the following types of eyewear must be worn:

(i) Goggles.

(ii) Face shield.

(iii) Safety glasses with front, brow, and temple protection.

(iv) Full-face respirator.

(h) When a "chemical-resistant apron" is specified by the product labeling, an apron that covers the front of the body from mid-chest to the knees shall be worn.

(i) When a respirator is specified by the product labeling, it shall be appropriate for the pesticide product used and for the activity to be performed. The handler employer shall assure that the respirator fits correctly by using the procedures consistent with chapter 296-307 WAC, Part Y-5. If the label does not specify the type of respirator to be used, it shall meet the requirements of chapter 296-307 WAC, Part Y-5. The respiratory protection requirements of chapter 296-307 WAC, Part Y-5, shall apply.

(j) When "chemical-resistant headgear" is specified by the product labeling, it shall be either a chemical-resistant hood or a chemical-resistant hat with a wide brim.

(4) Exceptions to personal protective equipment specified on product labeling.

(a) Body protection.

(i) A chemical-resistant suit may be substituted for "coveralls," and any requirement for an additional layer of clothing beneath is waived.

(ii) A chemical-resistant suit may be substituted for "coveralls" and a chemical-resistant apron.

(b) Boots. If chemical-resistant footwear with sufficient durability and a tread appropriate for wear in rough terrain is not obtainable, then leather boots may be worn in such terrain.

(c) Gloves. If chemical-resistant gloves with sufficient durability and suppleness are not obtainable, then during handling activities with roses or other plants with sharp thorns, leather gloves may be worn over chemical-resistant glove liners. However, once leather gloves are worn for this use, thereafter they shall be worn only with chemical-resistant liners and they shall not be worn for any other use.

(d) Closed systems. If handling tasks are performed using properly functioning systems that enclose the pesticide to prevent it from contacting handlers or other persons, and if such systems are used and are maintained in accordance with that manufacturer's written operating instructions, exceptions to labeling-specified personal protective equipment for the handling activity are permitted as provided in (d)(i) and (ii) of this subsection.

(i) Persons using a closed system to mix or load pesticides with a signal word of DANGER or WARNING may substitute a long-sleeved shirt, long pants, shoes, socks, chemical-resistant apron, and any protective gloves specified on the labeling for handlers for the labeling-specified personal protective equipment.

(ii) Persons using a closed system to mix or load pesticides other than those in (d)(i) of this subsection or to perform other handling tasks may substitute a long-sleeved shirt,

long pants, shoes, and socks for the labeling-specified personal protective equipment.

(ii) Persons using a closed system that operates under pressure shall wear protective eyewear.

(iv) Persons using a closed system shall have all labeling-specified personal protective equipment immediately available for use in an emergency.

(e) Enclosed cabs. If handling tasks are performed from inside a cab that has a nonporous barrier which totally surrounds the occupants of the cab and prevents contact with pesticides outside of the cab, exceptions to personal protective equipment specified on the product labeling for that handling activity are permitted as provided in (e)(i) through (iv) of this subsection.

(i) Persons occupying an enclosed cab may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If a respiratory protection device is specified on the pesticide product labeling for the handling activity, it must be worn.

(ii) Persons occupying an enclosed cab that has a properly functioning ventilation system which is used and maintained in accordance with the manufacturer's written operating instructions and which is declared in writing by the manufacturer and by the Washington state department of labor and industries to provide respiratory protection equivalent to or greater than a dust/mist filtering respirator may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If a respiratory protection device other than a dust/mist-filtering respirator is specified on the pesticide product labeling, it must be worn.

(iii) Persons occupying an enclosed cab that has a properly functioning ventilation system which is used and maintained in accordance with the manufacturer's written operating instructions and which is declared in writing by the manufacturer and by the Washington state department of labor and industries to provide respiratory protection equivalent to or greater than the vapor-removing or gas-removing respirator specified on pesticide product labeling may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If an air-supplying respirator or a self-contained breathing apparatus (SCBA) is specified on the pesticide product labeling, it must be worn.

(iv) Persons occupying an enclosed cab shall have all labeling-specified personal protective equipment immediately available and stored in a chemical-resistant container, such as a plastic bag. They shall wear such personal protective equipment if it is necessary to exit the cab and contact pesticide-treated surfaces in the treated area. Once personal protective equipment is worn in the treated area, it must be removed before reentering the cab.

(f) Aerial applications.

(i) Use of gloves. Chemical-resistant gloves shall be worn when entering or leaving an aircraft contaminated by pesticide residues. In the cockpit, the gloves shall be kept in an enclosed container to prevent contamination of the inside of the cockpit.

(ii) Open cockpit. Persons occupying an open cockpit shall use the personal protective equipment specified in the product labeling for use during application, except that chemical-resistant footwear need not be worn. A helmet may be

substituted for chemical-resistant headgear. A visor may be substituted for protective eyewear.

(iii) Enclosed cockpit. Persons occupying an enclosed cockpit may substitute a long-sleeved shirt, long pants, shoes, and socks for labeling-specified personal protective equipment.

(g) Crop advisors. Crop advisors entering treated areas while a restricted-entry interval is in effect may wear the personal protective equipment specified on the pesticide labeling for early entry activities instead of the personal protective equipment specified on the pesticide labeling for handling activities, provided:

(i) Application has been completed for at least four hours.

(ii) Any inhalation exposure level listed in the labeling has been reached or any ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling have been met.

(5) Use of personal protective equipment.

(a) The handler employer shall assure that personal protective equipment is used correctly for its intended purpose and is used according to the manufacturer's instructions.

(b) The handler employer shall assure that, before each day of use, all personal protective equipment is inspected for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(6) Cleaning and maintenance.

(a) The handler employer shall assure that all personal protective equipment is cleaned according to the manufacturer's instructions or pesticide product labeling instructions before each day of reuse. In the absence of any such instructions, it shall be washed thoroughly in detergent and hot water.

(b) If any personal protective equipment cannot be cleaned properly, the handler employer shall dispose of the personal protective equipment in accordance with any applicable federal, state, and local regulations. Coveralls or other absorbent materials that have been drenched or heavily contaminated with an undiluted pesticide that has the signal word DANGER or WARNING on the label shall be not be reused.

(c) The handler employer shall assure that contaminated personal protective equipment is kept separately and washed separately from any other clothing or laundry.

(d) The handler employer shall assure that all clean personal protective equipment shall be either dried thoroughly before being stored or shall be put in a well ventilated place to dry.

(e) The handler employer shall assure that all personal protective equipment is stored separately from personal clothing and apart from pesticide-contaminated areas.

(f) The handler employer shall assure that when dust/mist filtering respirators are used, the filters shall be replaced:

(i) When breathing resistance becomes excessive.

(ii) When the filter element has physical damage or tears.

(iii) According to manufacturer's recommendations or pesticide product labeling, whichever is more frequent.

(iv) In the absence of any other instructions or indications of service life, at the end of each day's work period.

(g) The handler employer shall assure that when gas-removing or vapor-removing respirators are used, the gas-removing or vapor-removing canisters or cartridges shall be replaced:

(i) At the first indication of odor, taste, or irritation.

(ii) According to manufacturer's recommendations or pesticide product labeling, whichever is more frequent.

(iii) In the absence of any other instructions or indications of service life, at the end of each day's work period.

(h) The handler employer shall inform any person who cleans or launders personal protective equipment:

(i) That such equipment may be contaminated with pesticides.

(ii) Of the potentially harmful effects of exposure to pesticides.

(iii) Of the correct way(s) to clean personal protective equipment and to protect themselves when handling such equipment.

(i) The handler employer shall assure that handlers have a clean place(s) away from pesticide storage and pesticide use areas where they may:

(i) Store personal clothing not in use.

(ii) Put on personal protective equipment at the start of any exposure period.

(iii) Remove personal protective equipment at the end of any exposure period.

(j) The handler employer shall not allow or direct any handler to wear home or to take home personal protective equipment contaminated with pesticides.

(7) Heat-related illness. When the use of personal protective equipment is specified by the labeling of any pesticide for the handling activity, the handler employer shall assure that no handler is allowed or directed to perform the handling activity unless appropriate measures are taken, if necessary, to prevent heat-related illness.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-13045, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-13045, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-13045, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13045, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13050 Decontamination—Standards for pesticide handlers—40 CFR, § 170.250.** (1) Requirement. During any handling activity, the handler employer shall provide for handlers, in accordance with this section, decontamination supplies for washing off pesticides and pesticide residues.

(2) General conditions.

(a) The handler employer shall provide handlers with enough water for routine washing, for emergency eyeflushing, and for washing the entire body in case of an emergency. At all times when the water is available to handlers, the handler employer shall assure that it is of a quality and temperature that will not cause illness or injury when it contacts the skin or eyes or if it is swallowed. At least ten gallons of water for one employee and twenty gallons of water for two or more employees shall be provided at mixing and loading sites that do not have running water.

(b) When water stored in a tank is to be used for mixing pesticides, it shall not be used for decontamination or eyeflushing, unless the tank is equipped with properly functioning valves or other mechanisms that prevent movement of pesticides into the tank.

(c) The handler employer shall provide soap and single-use towels in quantities sufficient to meet handlers' needs.

(d) The handler employer shall provide one clean change of clothing, such as coveralls for use in an emergency.

(3) Location. The decontamination supplies shall be located together and reasonably accessible to and not more than one-quarter mile from each handler during the handling activity.

(a) Exception for mixing sites. For mixing activities, the decontamination supplies shall be at the mixing site.

(b) Exception for pilots. The decontamination supplies for a pilot who is applying pesticides aerially shall be in the airplane or at the aircraft loading site.

(c) Exception for handling pesticides in remote areas. When handling activities are performed more than one-quarter mile from the nearest place of vehicular access:

(i) The soap, single-use towels, clean change of clothing, and water may be at the nearest place of vehicular access.

(ii) The handler employer may permit handlers to use clean water from springs, streams, lakes, or other sources for decontamination at the remote work site, if such water is more accessible than the water with the decontamination supplies located at the nearest place of vehicular access.

(d) Decontamination supplies in treated areas. The decontamination supplies shall not be in an area being treated with pesticides or in an area under a restricted-entry interval, unless:

(i) The decontamination supplies are in the area where the handler is performing handling activities;

(ii) The soap, single-use towels, and clean change of clothing are in enclosed containers; and

(iii) The water is running tap water or is enclosed in a container.

(4) Emergency eyeflushing. To provide for emergency eyeflushing, the handler employer shall assure that at least one pint of water is immediately available to each handler who is performing tasks for which the pesticide labeling requires protective eyewear. The eyeflush water shall be carried by the handler, or shall be on the vehicle or aircraft the handler is using, or shall be otherwise immediately accessible.

(5) A plumbed or portable emergency eyewash capable of delivering at least 1.5 liters (0.4 gals.) of water per minute for fifteen minutes shall be provided at all pesticide mixing and loading stations or handler decontamination sites when the label requires protective eyewear for mixing, loading or applying. A plumbed or portable system meeting the above requirements shall be provided at all permanent pesticide mixing and loading sites.

(6) Decontamination after handling activities. At the end of any exposure period, the handler employer shall provide at the site where handlers remove personal protective equipment, soap, clean towels, and a sufficient amount of water so that the handlers may wash thoroughly. At least ten gallons of water for one employee and twenty gallons of water for two or more employees shall be provided at mixing and loading sites that do not have running water.

[97-09-013, recodified as § 296-307-13050, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13050, filed 9/30/96, effective 11/1/96.]

**WAC 296-307-13055 Emergency assistance—Standards for pesticide handlers—40 CFR, § 170.260.** If there is reason to believe that a person who is or has been employed by an agricultural establishment or commercial pesticide handling establishment to perform pesticide handling tasks has been poisoned or injured by exposure to pesticides as a result of that employment, including, but not limited to, exposures from handling tasks or from application, splash, spill, drift, or pesticide residues, the handler employer shall:

(1) Make available to that person prompt transportation from the place of employment or the handling site to an appropriate emergency medical facility.

(2) Provide to that person or to treating medical personnel, promptly upon request, any obtainable information on:

(a) Product name, EPA registration number, and active ingredients of any product to which that person might have been exposed.

(b) Antidote, first-aid, and other medical information from the product labeling.

(c) The circumstances of handling of the pesticide.

(d) The circumstances of exposure of that person to the pesticide.

[97-09-013, recodified as § 296-307-13055, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13055, filed 9/30/96, effective 11/1/96.]

## Part J Pesticides Recordkeeping

### WAC 296-307-145 Pesticides recordkeeping.

[97-09-013, recodified as § 296-307-145, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-145, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-14505 What records must an employer keep for pesticide applications?** (1) If you apply pesticides, or have pesticides applied for you, related to the production of an agricultural crop, you must keep records for each application. The records must include the following:

(a) The address or exact location where the pesticide was applied or stored;

Note: If you apply pesticides to one acre or more, the location must be shown on the map on the required form for at least the first application.

(b) The year, month, day, and time the pesticide was applied or stored;

(c) The product name on the registered label and the United States Environmental Protection Agency registration number, if applicable, of the pesticide that was applied or stored;

(d) The crop or site to which the pesticide was applied (application crop or site);

(e) The amount of pesticide applied per acre, or other appropriate measure;

(f) The concentration of pesticide applied;

(g) The total area to which pesticide was applied;

(h) If applicable, the licensed applicator's name, address, and telephone number and the name of the individual(s) making the application;

(i) The direction and estimated velocity of the wind at the time the pesticide was applied;

Exception: Wind information does not have to be recorded for applications of baits in bait stations and pesticide applications within structures.

(j) Any other reasonable information required by the department.

(2) A commercial pesticide applicator must provide a copy of the pesticide application records to the owner or lessee of the lands to which the pesticide is applied. Pesticide application records may be provided on any form that includes all required information.

(3) You must update records on the same day that a pesticide is applied. You may use a copy as the record of the pesticide application. You must maintain the records for at least seven years after the date of the application.

(4) You must ensure that pesticide application records are readily accessible to employees and their designated representatives in a central location in the workplace. The records must be available beginning on the day the application is made and for at least thirty days after. You may view the pesticide application records and make your own record from that information.

(5) New or newly assigned employees must be made aware of the accessibility of the application records before working with pesticides or in an area containing pesticides.

(6) When storing pesticides, you must, at least once a year, perform an inventory of the pesticides stored in any work area.

(7) The pesticide inventory records must include the following information:

(a) The location where the pesticide is stored;

(b) The year, month, day, and time the pesticide was first stored;

(c) The product name used on the registered label and the United States Environmental Protection Agency registration number, if applicable, of the pesticide that is stored; and

(d) The amount of pesticide in storage at the time of the inventory.

(8) You must maintain a record of pesticide purchases made between the annual inventory dates.

(a) Instead of this purchase record, you may obtain from distributors from whom you buy pesticides, a statement obligating the distributor to maintain the purchase records on your behalf to meet the requirements of this section.

(b) We may require you to submit all purchase records covering the purchases during a specified period of time or in a specified geographical area.

(9) When you end all pesticide activities, you must file the records with us. Anyone who succeeds or replaces you must retain the records required by this section, but that person is not liable for any violations you commit.

(10) You must ensure that the records required under this section are readily accessible to us for inspection. You must also provide copies of the records on request, to:

(a) An employee or the employee's designated representative in the case of an industrial insurance claim filed under Title 51 RCW with the department of labor and industries;

(b) Treating health care personnel; or

(c) The pesticide incident reporting and tracking review panel.

(2007 Ed.)

(11) The designated representative or treating health care personnel are not required to identify the employee represented or treated.

(12) We will keep the name of any affected employee confidential according to RCW 49.17.080(1).

(13) When treating health care personnel request records under this section, and the record is required to determine treatment, you must provide copies of the record immediately. Information for treating health care personnel must be made immediately available by telephone, if requested, with a copy of the records provided within twenty-four hours. For all other requests, you must provide copies of the records within seventy-two hours.

(14) If requested, you must provide copies of records on a form provided by the department.

(15) If you suspect that an employee is ill or injured because of an exposure to one or more pesticides, you must immediately provide the employee with a copy of the relevant pesticide application records.

(16) If you refuse to provide a copy of a requested record, the requester may notify the department of the request and your refusal.

(a) Within seven working days, we will request that you provide us with all pertinent copies of the records, except that in a medical emergency we will request within two working days.

(b) You must provide copies of the records to us within twenty-four hours after we request.

(17) We inspect for the records required under this section as part of any on-site inspection of a workplace conducted under this chapter or chapter 49.17 RCW. We will determine, during the inspection, whether the records are readily transferable to a form adopted by the department, and readily accessible to employees. However, your records will not be inspected more than once in any calendar year, unless a previous inspection has found recordkeeping violations. If recordkeeping violations are found, we may conduct reasonable multiple inspections, according to department rules. Nothing in this section limits our inspection of records pertaining to pesticide-related injuries, illnesses, fatalities, accidents, or complaints.

(18) If you fail to maintain the records, or provide access to or copies of the records required under this section, you will be subject to penalties authorized under RCW 49.17.180.

(19) The department of labor and industries and the department of agriculture will jointly adopt by rule, forms that satisfy the information requirements of this section and RCW 17.21.100. Pesticide application record forms can be found in chapter 16-228 WAC, General pesticide rules.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-13-129, § 296-307-14505, filed 6/22/04, effective 8/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-14505, filed 8/8/01, effective 9/1/01. 97-09-013, recodified as § 296-307-14505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-14505, filed 10/31/96, effective 12/1/96.]



Respond to depressed cholinesterase levels

WAC 296-307-14825.

Provide medical removal protection benefits

WAC 296-307-14830.

Maintain records

WAC 296-307-14835.

Provide training

WAC 296-307-14840.

Implementation plan

WAC 296-307-14845.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-24-105, § 296-307-148, filed 12/3/03, effective 2/1/04.]

### **WAC 296-307-14805 Maintain handling records for covered pesticides.**

#### **You must:**

- Maintain accurate records of all time that each employee spends handling category I or II organophosphate or N-methyl-carbamate pesticides (this includes employees who do not meet the handling hour thresholds in WAC 296-307-14810).

- Provide a completed CHOLINESTERASE MONITORING HANDLING HOURS REPORT (F413-065-000) to the physician or other licensed health care professional (LHCP) for each employee receiving a periodic cholinesterase blood test and make sure the report is submitted to the laboratory with each periodic cholinesterase test.

- Provide the employee with a copy of the CHOLINESTERASE MONITORING HANDLING HOURS REPORT upon request.

- Retain pesticide handling records for seven years.

- Make sure that pesticide-handling records are readily accessible to employees, their designated representatives, and treating health care professionals.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-074, § 296-307-14805, filed 12/20/05, effective 2/1/06; 03-24-105, § 296-307-14805, filed 12/3/03, effective 2/1/04.]

### **WAC 296-307-14810 Implement a medical monitoring program.**

#### **You must:**

- Implement a medical monitoring program for your employees who handle or will be expected to handle category I or II organophosphate or N-methyl-carbamate pesticides for thirty or more hours in any consecutive thirty-day period.

**Note:**

- You do not need to count time spent mixing and loading using closed systems (as defined in WAC 296-307-13045 (4)(d)) in determining the need for periodic testing. Closed cabs are not "closed systems." Time using closed systems is still counted for purposes of establishing coverage under this rule and determining the need for obtaining baseline cholinesterase levels.

- The first thirty consecutive day period begins on the first day of handling organophosphate or N-methyl-carbamate pesticides after obtaining the baseline cholinesterase test.

- There is nothing in this rule that prohibits employers from providing cholinesterase monitoring to employees who handle organophosphate or N-methyl-carbamate pesticides for fewer than thirty hours in any consecutive thirty-day period.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-074, § 296-307-14810, filed 12/20/05, effective 2/1/06; 03-24-105, § 296-307-14810, filed 12/3/03, effective 2/1/04.]

(2007 Ed.)

### **WAC 296-307-14815 Identify a physician or other licensed health care professional.**

#### **You must:**

- Identify a physician or other licensed health care professional (LHCP) who will:

- Provide baseline and periodic cholinesterase testing through the department of health public health laboratory or a laboratory approved by the department of labor and industries.

- Interpret cholinesterase tests.

- Provide you with a written recommendation for each employee's blood test and evaluation.

- Obtain the LHCP's written recommendation for each employee's blood test and evaluation (including baseline tests) and make sure that the employee receives a copy of the LHCP's written recommendation, either through you or directly through the LHCP, within five business days after you receive the recommendation.

- Make sure the LHCP's written recommendation for each employee's blood test and evaluation is limited to the following information:

- The employee's cholinesterase status based on the LHCP's evaluation.

- Identification of changes in cholinesterase levels requiring a work practice evaluation for the employee.

- Identification of changes in cholinesterase levels requiring the employee to be removed from handling and other exposure to organophosphate and N-methyl-carbamate pesticides.

- Guidance on medical monitoring.

- Any other relevant information concerning an employee's workplace exposure to organophosphate and N-methyl-carbamate pesticides.

**Note:** All testing for an employee should be conducted through the same laboratory. This will allow for accurate comparison between baseline and periodic tests.

#### **You must:**

- Instruct the LHCP to **NOT** reveal in writing or in any other communication with you any other personally identifiable medical information.

**Note:** If the LHCP written recommendation contains specific findings or diagnoses unrelated to occupational exposure, you should send it back and obtain a revised version without the additional information.

#### **You must:**

- Make sure the LHCP is familiar with the requirements of this rule (for example, by providing a copy of the rule or by confirming that the provider has attended training on the rule).

- Post the name, address, and telephone number of the LHCP you have identified at the locations where employees usually start their work day.

- Make sure written recommendations from the LHCP are maintained for seven years.

**Note:** You may only obtain the employee's actual test results if the employee provides the LHCP with written consent to share these results with you.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-074, § 296-307-14815, filed 12/20/05, effective 2/1/06; 03-24-105, § 296-307-14815, filed 12/3/03, effective 2/1/04.]

**WAC 296-307-14820 Make cholinesterase testing available.**

**You must:**

- Make medical monitoring available to employees who will meet the handling hour threshold of thirty or more hours in any consecutive thirty-day period (WAC 296-307-14810) at no cost and at a reasonable time and place, as follows:
  - Provide annual baseline red blood cell (RBC) and serum cholinesterase tests that are taken at least thirty days after the employee last handled organophosphate or N-methyl-carbamate pesticides.
  - Provide periodic RBC and serum cholinesterase testing:

- Within three days after the end of each thirty-day period where the employee meets the handling hour threshold in WAC 296-307-14810; however, testing is not required more often than every thirty days;

**OR**

- At least every thirty days for those employees who may meet the handling hour threshold in WAC 296-307-14810.
    - Follow the recommendations of the LHCP regarding continued employee pesticide handling or removal from handling until a thirty-day exposure free baseline can be established.

**Exemption:** You do not need to provide baseline or periodic testing for those employees whose work exposure is limited to handling only N-methyl-carbamate pesticides.

**Note:**

- For employees who have had exposure to organophosphate or N-methyl-carbamate pesticides in the thirty days prior to the test obtain a working baseline. For example, a worker who initially declines cholinesterase testing and later chooses to participate in testing would obtain a "working baseline."
- For new employees, the LHCP may accept previous baselines, if they are obtained according to this rule.

**You must:**

- Obtain a signed declination statement from the LHCP for each employee who declines cholinesterase testing.
  - Employees may decline cholinesterase testing only after they receive training about cholinesterase inhibiting pesticides and discuss the risks and benefits of participation with the LHCP.
  - An employee may change his or her mind and elect to participate or decline to continue participation in the testing program at any time.
    - Make sure the employee receives a copy of the signed declination statement, either through you or directly through the LHCP, within five business days after you receive the declination statement.

**Note:** If employers discourage participation in cholinesterase monitoring, or in any way interfere with an employee's decision to continue with this program, this interference may represent unlawful discrimination under RCW 49.17-160, Discrimination against employee filing, instituting proceedings, or testifying prohibited—Procedure—Remedy.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-01-074, § 296-307-14820, filed 12/20/05, effective 2/1/06; 03-24-105, § 296-307-14820, filed 12/3/03, effective 2/1/04.]

**WAC 296-307-14825 Respond to depressed cholinesterase levels.**

**You must:**

[Title 296 WAC—p. 2414]

- Respond to an employee's depressed cholinesterase levels by:

- Taking the actions required in Table 1;

**AND**

- Following any additional occupational health recommendations from the LHCP.

**Table 1  
Required Responses to an Employee's Depressed Cholinesterase Levels**

When:	Action to be taken:	Methods:
An employee's RBC or serum cholinesterase levels fall more than twenty percent below the baseline	Evaluate the employee's work-place and work practices to identify and correct potential sources of pesticide exposure	Review: <ul style="list-style-type: none"> <li>• Personal protective equipment (PPE) and its condition</li> <li>• Employees' PPE usage</li> <li>• General sanitation and decontamination practices and availability of decontamination facilities required by WAC 296-307-13050</li> <li>• Pesticide handling practices</li> <li>• Pesticide label requirements</li> </ul>
An employee's RBC cholinesterase level falls thirty percent or more from the baseline	Remove the employee from handling and other work exposures to organophosphate and N-methyl-carbamate pesticides such as thinning and harvesting in recently treated areas	<ul style="list-style-type: none"> <li>• When available, provide the employee with other duties that do not include handling and other work exposures to organophosphate and N-methyl-carbamate pesticides</li> <li>• Provide medical monitoring and cholinesterase testing as recommended by the LHCP</li> <li>• Provide salary and benefits as if employee was continuing pesticide application activities</li> </ul>
<b>OR</b>	<b>AND</b>	
An employee's serum cholinesterase level falls forty percent or more from the baseline	Evaluate the employee's work practices to identify and correct potential sources of pesticide exposure	
A removed employee's cholinesterase levels return to twenty percent or less below baseline	The employee may return to handling class I and II organophosphate and N-methyl-carbamate pesticides	Continue periodic cholinesterase monitoring

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-01-074, § 296-307-14825, filed 12/20/05, effective 2/1/06; 03-24-105, § 296-307-14825, filed 12/3/03, effective 2/1/04.]

**WAC 296-307-14830 Provide medical removal protection benefits.****You must:**

- Provide medical removal protection benefits for a maximum of three months on each occasion:
  - An employee is temporarily removed from work due to depressed cholinesterase levels;

**OR**

- Assigned to other duties due to depressed cholinesterase levels.
  - Provide medical removal protection benefits that include maintenance of the same pay, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to organophosphate or N-methyl-carbamate pesticides or otherwise limited.

**Note:** The following are examples of how a worker's pay could be maintained while medically removed from exposure to cholinesterase-inhibiting pesticides:

- A removed worker is assigned to work eight hours a day but the employer's pesticide handlers are working ten hours a day. The removed worker would be paid for ten hours at the handler's pay rate.
- The farmer pays workers two dollars more per hour when they are handling organophosphate or N-methyl-carbamate pesticides. The removed worker will be paid this premium when the pesticides are being handled on the farm; however, the worker will be paid at their usual pay rate when the pesticides are not being handled on the farm.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-01-074, § 296-307-14830, filed 12/20/05, effective 2/1/06; 03-24-105, § 296-307-14830, filed 12/3/03, effective 2/1/04.]

**WAC 296-307-14835 Maintain records.****You must:**

- Make sure that the following records are maintained:
  - The name, address, and telephone number of the physician or LHCP.
  - Written recommendations and opinions received from the physician or LHCP.
  - Findings of all work practice investigations.
  - Dates when employees were medically removed from their duties and dates when employees are returned to duties that include handling organophosphate or N-methyl-carbamate pesticides.
  - Signed declination statements.
- Maintain records for seven years.
- Make sure that all records are readily accessible to the employee and his or her designated representative.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060, 03-24-105, § 296-307-14835, filed 12/3/03, effective 2/1/04.]

**WAC 296-307-14840 Provide training.****You must:**

- Make sure employees have received training before initial medical monitoring. The training must include at least the following:
  - The human health hazards and physical symptoms of overexposure to organophosphate and N-methyl-carbamate cholinesterase-inhibiting pesticides.
  - The purpose and requirements for medical monitoring.

**Note:** Training required by this rule may be combined with other pesticide handler training as required by WAC 296-307-13025, Pesticide safety training—Standards for pesticide handlers.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060, 03-24-105, § 296-307-14840, filed 12/3/03, effective 2/1/04.]

**WAC 296-307-14845 Implementation plan.** The department will implement and complete an evaluation of this rule by doing the following:

- Organize a scientific team to oversee collection and analysis of data collected during 2004 and 2005. L&I will select representatives of the University of Washington, Washington State University, as well as other interested members of the academic and scientific communities, to participate on the team. The team will provide an initial analysis of testing data and any appropriate recommendations directly to L&I and to the cholinesterase monitoring advisory committee by November 1, 2004, and a further analysis and any appropriate recommendations by November 1, 2005. A final report and recommendations will be completed by September 30, 2006.

- Establish a cholinesterase stakeholder advisory committee to evaluate issues related to rule implementation and provide recommendations to the department regarding implementation of the rule and any possible modifications to it. L&I will invite representatives of growers, labor and other affected state agencies to participate on the advisory committee. The committee will have an opportunity to comment on the analysis completed by the scientific team and to make any appropriate recommendations before December 1, 2004, and again before December 1, 2005. In addition, the committee will review the scientific committee's final report and recommendations and provide advice to L&I prior to December 1, 2006.

- Review reports from the scientific team and stakeholder advisory committee, and other relevant information and make modifications to the rule as appropriate.
  - Make efforts to defray the costs of medical testing during 2004.
  - Prepare and distribute provider guidelines.
  - Develop and make available a model employee training program.
  - Publish a list of trained providers and certified laboratories on the internet.
  - Coordinate recordkeeping requirements with the department of agriculture.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060, 03-24-105, § 296-307-14845, filed 12/3/03, effective 2/1/04.]

## Part K Working Near Overhead Lines

**WAC 296-307-150 Employees working near overhead lines.**

[97-09-013, recodified as § 296-307-150, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-150, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-15003 What does this section cover?** WAC 296-307-150 does not apply to the construction, reconstruction, operation, or maintenance of overhead electrical conductors (and their supporting structures and associated equipment) by authorized and qualified electrical employees. It also does not apply to authorized and qualified employees

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engaged in the construction, reconstruction, operations and maintenance of overhead electrical circuits or conductors (and their supporting structures and associated equipment) of rail transportation systems, or electrical generating, transmission, distribution, and communication systems.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-15003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-15003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-15006 What clearance and safeguards are required to protect employees working near overhead lines?** (1) All exposed overhead conductors must be isolated from accidental contact by employees or equipment.

(2) Irrigation pipe must not be stored within one hundred feet of overhead conductors.

(3) Upending irrigation pipe within one hundred feet of overhead conductors is prohibited.

(4) Water and irrigation systems, and other devices that discharge a conductive liquid, must be set up and operated so that the discharge from the system is directed more than ten feet away from overhead high-voltage lines, and avoids contact with any exposed electrical power conductor.

(5) Employees are prohibited from entering or working in proximity to high-voltage lines, unless there are guards to prevent accidental contact.

Note: Voltage 600V and higher is considered high voltage.

(6) The following are prohibited if it is possible to bring these objects within ten feet of high-voltage lines:

(a) Operating, erecting, or transporting tools, equipment, or a moving part;

(b) Handling, transporting, or storing materials; or

(c) Moving a building near high-voltage lines.

(7) Equipment or machines must be operated near power lines according to the following:

(a) For lines rated 50 kv. or below, minimum clearance between the lines and any part of the object must be ten feet;

(b) For lines rated over 50 kv. minimum clearance between the lines and any part of the object must be ten feet plus four tenths of an inch for each 1 kv., over 50 kv., or twice the length of the line insulator but never less than ten feet;

(c) In transit, the clearance must be a minimum of four feet for voltages less than 50 kv., ten feet for voltages over 50 kv. up to and including 345 kv., and sixteen feet for voltages up to and including 750 kv.;

(d) You must designate someone to observe clearance and give warning for operations where it is difficult for the operator to see well enough to maintain the necessary clearance.

Exception: You are exempt from this requirement if electrical distribution and transmission lines have been deenergized and visibly grounded at point of work; or if insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines.

[97-09-013, recodified as § 296-307-15006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-15009 What signs must an employer post to warn employees working near overhead lines?** You must post and maintain in plain view of the operator on

each derrick, power-shovel, drilling-rig, hay loader, hay stacker, or similar apparatus with parts that are capable of vertical, lateral or swinging motion, a durable warning sign legible at twelve feet that says, "unlawful to operate this equipment within ten feet of high-voltage lines."

[97-09-013, recodified as § 296-307-15009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-15012 When must an employer notify the utility of employees working near overhead lines?** The employer must notify the operator of high-voltage lines when any operations are to be performed, tools or materials handled, or equipment is to be moved or operated within ten feet of any high-voltage line. All required safety measures must be completed before proceeding with any work that would reduce the clearance requirements of this section.

[97-09-013, recodified as § 296-307-15012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15012, filed 10/31/96, effective 12/1/96.]

## Part L

### Temporary Worker Housing

#### WAC 296-307-161 Temporary worker housing.

[Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374. 00-06-081, § 296-307-161, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16101 Purpose and applicability.** (1) Purpose. This part is adopted by the Washington state department of labor and industries to implement the provisions of chapter 49.17 RCW and establish minimum health and safety requirements for temporary worker housing.

(2) Applicability.

(a) This part applies only to operators of temporary worker housing. Operators using tents within the cherry harvest season must refer to WAC 296-307-163, Part L-1, or chapter 246-361 WAC.

(b) Operators with ten or more occupants are required to be licensed under this part. Operators with nine or less employees are not required to be licensed, but must comply with these standards.

(c) For department of health licensing, on-site survey, water test fees, etc., see WAC 246-358-990.

[Statutory Authority: RCW 49.17.010, [49.17.]040, and [49.17.]050 and 1999 c 374. 00-06-081, § 296-307-16101, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16103 Definitions.** For the purposes of this part, the following words and phrases will have the following meanings unless the context clearly indicates otherwise:

**"Agricultural employee"** means any person who renders personal services to, or under the direction of, an agricultural employer in connection with the employer's agricultural activity.

**"Agricultural employer"** means any person engaged in agricultural activity, including the growing, producing, or harvesting of farm or nursery products, or engaged in the forestation or reforestation of lands, which includes but is not limited to the planting, transplanting, tubing, precommercial thinning, and thinning of trees and seedlings, the clearing,

piling, and disposal of brush and slash, the harvest of Christmas trees, and other related activities.

**"Building"** means any structure used or intended to be used for supporting or sheltering any use or occupancy that may include cooking, eating, sleeping, and sanitation facilities.

**"Common food-handling facility"** means an area designated by the operator for occupants to store, prepare, cook, and eat their own food supplies.

**"Current certificate (first aid)"** means a first-aid training certificate that has not expired.

**"Department"** means the Washington state department of health and/or the department of labor and industries.

**"Dining hall"** means a cafeteria-type eating place with food furnished by and prepared under the direction of the operator for consumption, with or without charge, by occupants.

**"Drinking fountain"** means a fixture equal to a nationally recognized standard or a designed-to-drain faucet, which provides potable drinking water under pressure. "Drinking fountain" does not mean a bubble-type water dispenser.

**"Dwelling unit"** means a shelter, building, or portion of a building, that may include cooking and eating facilities, which is:

- Provided and designated by the operator as either a sleeping area, living area, or both, for occupants; and
- Physically separated from other sleeping and common-use areas.

**"First-aid qualified"** means that the person holds a current certificate of first-aid training from the American Red Cross or another course with equivalent content or hours.

**"Food-handling facility"** means a designated, enclosed area for preparation of food.

**"Group A water system"** means a public water system and includes community and noncommunity water systems.

(a) A community water system means any Group A water system providing service to fifteen or more service connections used by year-round residents for one hundred eighty or more days within a calendar year, regardless of the number of people, or regularly serving at least twenty-five year-round (i.e., more than one hundred eighty days per year) residents.

(b) A noncommunity water system means a Group A water system that is not a community water system. Noncommunity water systems are further defined as:

(i) Nontransient (NTNC) water system that provides service opportunity to twenty-five or more of the same nonresidential people for one hundred eighty or more days within a calendar year.

(ii) Transient (TNC) water system that serves:

- Twenty-five or more of the same people each day for sixty or more days within a calendar year;
- Twenty-five or more of the same people each day for sixty or more days, but less than one hundred eighty days within a calendar year; or
- One thousand or more people for two or more consecutive days within a calendar year.

**"Group B water system"** means a public water system:

(a) Constructed to serve less than fifteen residential services regardless of the number of people; or

(b) Constructed to serve an average nonresidential population of less than twenty-five per day for sixty or more days within a calendar year; or

(c) Any number of people for less than sixty days within a calendar year.

**"Habitable room"** means a room or space in a structure with a minimum seven-foot ceiling used for living, sleeping, eating, or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space, and similar areas are not considered habitable space.

**"Health officer"** means the individual appointed as such for a local health department under chapter 70.05 RCW or appointed as the director of public health of a combined city-county health department under chapter 70.08 RCW.

**"Livestock"** means horses, cows, pigs, sheep, goats, poultry, etc.

**"Livestock operation"** means any place, establishment, or facility consisting of pens or other enclosures in which livestock is kept for purposes including, but not limited to, feeding, milking, slaughter, watering, weighing, sorting, receiving, and shipping. Livestock operations include, among other things, dairy farms, corrals, slaughterhouses, feedlots, and stockyards. Operations where livestock can roam on a pasture over a distance may be treated as outside the definition.

**"MSPA"** means the Migrant and Seasonal Agricultural Worker Protection Act (96 Stat. 2583; 29 U.S.C. Sec. 1801 et seq.).

**"Occupant"** means a temporary worker or a person who resides with a temporary worker at the housing site.

**"Operating license"** means a document issued annually by the department of health or contracted health officer authorizing the use of temporary worker housing.

**"Operator"** means a person holding legal title to the land on which temporary worker housing is located. However, if the legal title and the right to possession are in different persons, "operator" means a person having the lawful control or supervision over the temporary worker housing.

**"Recreational park trailers"** means a trailer-type unit that is primarily designed to provide temporary living quarters for recreational, camping, or seasonal use, that meets the following criteria:

- Built on a single chassis, mounted on wheels;
- Having a gross trailer area not exceeding 400 square feet (37.15 square meters) in the set-up mode; and
- Certified by the manufacturer as complying with ANSI A119.5.

**"Recreational vehicle"** means a vehicular-type unit primarily designed as temporary living quarters for recreational camping, travel, or seasonal use that either has its own motive of power or is mounted on, or towed by, another vehicle. Recreational vehicles include: Camping trailers, fifth-wheel trailers, motor homes, travel trailers, and truck campers, but does not include pickup trucks with camper shells, canopies, or other similar coverings.

**"Refuse"** means solid wastes, rubbish, or garbage.

**"Temporary worker"** means an agricultural employee employed intermittently and not residing year-round at the same site.

**"Temporary worker housing"** or **"housing"** means a place, area, or piece of land where sleeping places or housing

sites are provided by an agricultural employer for agricultural employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees for temporary, seasonal occupancy.

"**WISHA**" means the Washington Industrial Safety and Health Act, chapter 49.17 RCW, administered by the Washington state department of labor and industries.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16103, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16105 Operating license.** The operator:

(1) Must request a license from the department of health or health officer when:

(a) Housing consists of:

(i) Five or more dwelling units; or

(ii) Any combination of dwelling units, or spaces that house ten or more occupants.

(b) Compliance with MSPA requires a license; or

(c) Construction of camp buildings requires a license under chapter 246-359 WAC, Temporary worker housing construction standard.

(2) Must apply for an operating license at least forty-five days prior to either the use of housing or the expiration of an existing operating license by submitting to the department of health or health officer:

(a) A completed application on a form provided by the department of health or health officer;

(b) Proof water system is current with all water tests required by chapters 246-290 or 246-291 WAC; and

(c) A fee as specified in WAC 246-358-990.

(3) Will receive an operating license for the maximum number of occupants as determined by WAC 246-358-029 when:

(a) The application requirements from subsection (2) of this section are met;

(b) The housing is in compliance with this part as demonstrated by:

(i) A licensing survey completed by the department of health; or

(ii) A self-survey completed by the operator and approved by the department of health; and

(c) The operator complies with the corrective action plan established by the department.

(4) May allow the use of housing without a renewed license when all of the following conditions exist:

(a) The operator applied for renewal of an operating license in accordance with subsection (2) of this section at least forty-five days before occupancy, as evidenced by the post mark;

(b) The department of health or health officer has not inspected the housing or issued an operating license;

(c) Other local, state, or federal laws, rules, or codes do not prohibit use of the housing; and

(d) The operator provides and maintains housing in compliance with this part.

(5) Must post the operating license in a place readily accessible to occupants of the housing.

(6) Must notify the department of health or health officer of a transfer of ownership.

(7) Must cooperate with the department or health officer during on-site inspections.

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[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16105, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16110 Requirements for self-survey program.**

If a licensed operator meets the requirements provided in this section, then the operator may participate in the self-survey program. This means an operator is allowed to conduct a self-survey for two years. On the third year the department of health will conduct an on-site verification survey to assure compliance with this chapter and determine if the temporary worker housing still meets the requirements of the self-survey program.

(1) To be in the self-survey program the operator must:

(a) Meet the requirements of WAC 246-358-025;

(b) Not have had any valid complaints;

(c) Have had two consecutive years without any deficiencies or have had very minor deficiencies (for example one or two screens torn, missing a few small trash cans, etc.); and

(d) Be recommended by the health surveyor.

(2) For a licensed operator to remain in the self-survey program the licensed operator must:

(a) Continue to comply with subsection (1) of this section;

(b) Continue to not have any deficiencies or very minor deficiencies; and

(c) Not have a change in ownership.

(3) When licensed temporary worker housing changes ownership, the new licensed operator must comply with the requirements of subsection (1) of this section before being eligible to be on the self-survey program.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16110, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16115 Maximum housing occupancy.**

(1) The maximum occupancy for operator-supplied housing will be based on:

(a) The square footage of the housing facility; and

(b) The number of bathing, food handling, handwashing, laundry, and toilet facilities.

(2) The maximum occupancy for worker-supplied housing will be based on:

(a) The number of spaces designated for worker-supplied housing by the operator; and

(b) The number of bathing, food handling, handwashing, laundry, and toilet facilities in excess of those facilities required for operator-supplied housing.

Note: Worker-supplied housing includes recreational park trailers, recreation vehicles, OSHA compliant tents, or other structures that meet the requirements of this part.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16115, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16120 Variance and procedure.** Conditions may exist in operations that a state standard will not have practical use. The director of the department of labor and industries may issue a variance from the requirements of the standard when another means of providing equal protection is provided. The substitute means must provide equal protection in accordance with the requirements of chapter 49.17 RCW and chapter 296-350 WAC, variances.

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Applications for variances will be reviewed and may be investigated by the department of labor and industries and the department of health. Variances granted will be limited to the specific case or cases covered in the application and may be revoked for cause. The variance shall remain prominently posted on the premises while in effect.

Variance application forms may be obtained from the Department of Labor and Industries, P.O. Box 44625, Olympia, Washington 98504-4625 or the Department of Health, P.O. Box 47852, Olympia, Washington 98504-7852, upon request. Requests for variances from safety and health standards shall be made in writing to the director or the assistant director, Department of Labor and Industries, P.O. Box 44625, Olympia, Washington 98504-4625. (Reference RCW 49.17.080 and 49.17.090.)

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16120, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16125 Temporary worker housing sites.** The operator must:

(1) Locate and operate a site to prevent a health or safety hazard that is:

(a) Adequately drained and any drainage from and through the housing must not endanger any domestic or public water supply;

(b) Free from periodic flooding and depressions in which water may become a nuisance;

(c) At least two hundred feet from a swamp, pool, sink hole, or other surface collection of water unless there is a mosquito prevention program for those areas;

(d) Large enough to prevent overcrowding of necessary structures. The principal housing area for sleeping and for food preparation and eating must be at least five hundred feet from where livestock are kept; and

(e) The grounds and open areas surrounding the shelters must be in a clean and sanitary condition.

(2) Must develop and implement a temporary worker housing management plan and rules for operators with ten or more occupants, to assure that the housing is operated in a safe and secure manner and is kept within the approved capacity. Additionally, the licensed operator must:

(a) Inform occupants of the rules, in a language the occupant understands by providing individual copies of the rules to each occupant or posting the rules in the housing area;

(b) Restrict the number of occupants in the temporary worker housing to the capacity as determined by the department.

(3) When closing housing permanently or for the season, complete the following:

(a) Dispose of all refuse to prevent nuisance;

(b) Fill all abandoned toilet pits with earth; and

(c) Leave the grounds and buildings in a clean and sanitary condition.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16125, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16130 Water supply.** The operator must:

(1) Provide a water system that is:

(a) Approved as a Group A public water system in compliance with chapter 246-290 WAC if the water system sup-

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plies fifteen or more connections or twenty-five or more people at least sixty days per year or provide proof the temporary worker housing receives water from an approved Group A public water system; or

(b) Approved as a Group B water system in compliance with chapter 246-291 WAC if the water system supplies less than fifteen connections and does not supply twenty-five or more people at least sixty days per year.

Note: A "same farm exemption" applies to a public water system with four or fewer connections all of which serve residences on the same farm. "Same farm" means a parcel of land or series of parcels that are connected by covenants and devoted to the production of livestock or agricultural commodities for commercial purposes and does not qualify as a Group A water system.

	Avg. of less than 25 people	Avg. of 25 or more people
At least 60 days or more	Group B	Group A TNC
59 days or less	Group B	Group B

Note: If a system has fifteen or more connections, regardless of the population, it is a Group A water system.

(2) Provide an adequate and convenient hot and cold water supply for drinking, cooking, bathing, and laundry purposes.

Note: An "adequate water supply" means the storage capacity of the potable water system must meet the requirements of ASHRAE 1999 Applications Handbook, chapter 48, Water Systems.

(3) Ensure that the distribution lines are able to maintain the working pressure of the water piping system at not less than fifteen pounds per square inch after allowing for friction and other pressure losses.

(4) When water is not piped to each dwelling unit, provide cold, potable, running water under pressure within one hundred feet of each dwelling unit.

(5) When water sources are not available in each individual dwelling unit, provide one or more drinking fountains for each one hundred occupants or fraction thereof. Prohibit the use of common drinking cups or containers from which water is dipped or poured.

(6) When water is unsafe for drinking purposes and accessible to occupants, post a sign by the source reading "Do not drink. Do not use for washing. Do not use for preparing food" printed in English and in the native language of the persons occupying the housing, or marked with easily understood pictures or symbols.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16130, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16135 Sewage disposal.** The operator must:

(1) Provide sewage disposal systems in accordance with local health jurisdictions.

(2) Connect all drain, waste, and vent systems from buildings to:

(a) Public sewers, if available; or

(b) Approved on-site sewage disposal systems that are designed, constructed, and maintained as required in chapters 246-272 and 173-240 WAC, and local ordinances.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16135, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16140 Electricity and lighting.** The operator must ensure that:

(1) Electricity is supplied to all dwelling units, kitchen facilities, shower/bathroom facilities, common areas, and laundry facilities;

(2) All electrical wiring, fixtures and electrical equipment must comply with the electric standards of the department of labor and industries regulations, chapter 19.28 RCW, and local ordinances, and be maintained in a safe condition;

(3) Each habitable room must have at least one ceiling-type light fixture and at least one separate floor-type or wall-type convenience outlet;

(4) Laundry, toilet rooms, shower/bathroom facilities, and rooms where people congregate have at least one ceiling-type or wall-type fixture;

(5) General lighting and task lighting is adequate to carry on normal daily activities;

(6) Adequate lighting is provided for safe passage for occupants to handwashing sinks and toilets. Note: Lighting requirements may be met by natural or artificial means.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16140, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16145 Building requirements and maintenance.** An operator must:

(1) Construct buildings to provide protection against the elements and comply with:

(a) The State Building Code, chapter 19.27 RCW, or Temporary worker housing construction standard, chapter 246-359 WAC;

(b) State and local ordinances, codes, regulations; and

(c) This part. Any shelter meeting these requirements is acceptable.

(2) Identify each dwelling unit and space used for shelter by posting a number at each site.

(3) Maintain buildings in good repair and sanitary condition.

(4) Provide exits that are unobstructed and remain free of any material or matter where its presence would obstruct or render the exit hazardous.

(5) Provide a ceiling height of at least seven feet for each habitable room. If a building has a sloped ceiling, no portion of the room measuring less than seven feet from the finished floor to the finished ceiling will be included in any computation of the minimum floor space.

(6) Provide at least seventy square feet of floor space for the first occupant and at least fifty square feet of floor space for each additional occupant in each dwelling unit.

(7) Provide each room used for sleeping purposes with at least fifty square feet of floor space for each occupant.

(8) Provide floors in accordance with the State Building Code, chapter 19.27 RCW, or Temporary worker housing construction standard, chapter 246-359 WAC, that are tightly constructed and in good repair.

(9) Ensure wooden floors are at least one foot above ground level or meet the requirements in the State Building Code, chapter 19.27 RCW or Temporary worker housing construction standard, chapter 246-359 WAC.

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(10) Provide habitable rooms that have:

(a) Windows covering a total area equal to at least one-tenth of the total floor area and at least one-half of each window can be opened to the outside for ventilation; or

(b) Mechanical ventilation in accordance with applicable ASHRAE standards.

(11) Provide sixteen-mesh screening on all exterior openings and screen doors with self-closing devices.

(12) Install all heating, cooking, and water heating equipment according to state and local ordinances, codes, and regulations and maintain in a safe condition.

(13) Provide adequate heating equipment if habitable rooms, including bathrooms, are used during cold weather.

(14) Ensure that all recreational vehicles and park trailers meet the requirements of chapters 296-150P and 296-150R WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16145, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16150 Laundry facilities.** An operator must:

(1) Provide one laundry tray or tub or one mechanical washing machine for every thirty persons;

(2) Provide facilities for drying clothes;

(3) Provide sloped, coved floors of nonslip impervious materials with floor drains;

(4) Maintain laundry facilities in a clean and sanitary condition.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16150, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16155 Handwashing and bathing facilities.** An operator must:

(1) Provide one handwash sink for each family dwelling unit or for every six persons in centralized facilities. Handwash sinks must be adjacent to toilets;

(2) Provide one showerhead for each family dwelling unit or for every ten persons in centralized facilities;

(3) Provide one "service sink" in each building used for centralized laundry, handwashing, or bathing;

(4) Provide sloped, coved floors of nonslip impervious materials with floor drains;

(5) Ensure shower room walls are smooth and nonabsorbent to the height of four feet. If used, partitions must be smooth and nonabsorbent to the height of four feet;

(6) Provide all showers, baths, or shower rooms with floor drains to remove wastewater;

(7) Provide cleanable, nonabsorbent waste containers;

(8) Maintain centralized bathing and handwashing facilities in a clean and sanitary condition, cleaned at least daily;

(9) Request occupants of family dwelling units to maintain bathing and handwashing facilities in a clean and sanitary condition;

(10) Ensure shower facilities provide privacy from the opposite sex and the public; and

(11) Make showers and bathing facilities available when needed.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16155, filed 3/1/00, effective 3/1/00.]

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**WAC 296-307-16160 Toilet facilities.** (1) General toilet requirements. Operators must provide flush toilets unless chemical toilets or pit privies are specifically approved by the department of health or health officer according to requirements in chapter 246-272 WAC and ensure the following:

(a) Flush toilets, chemical toilets, and urinals must not be located in any sleeping room, dining room, cooking or food-handling facility.

(b) When chemical toilets are approved, they must be:

(i) Located at least fifty feet from any dwelling unit or food-handling facility;

(ii) Maintained by a licensed waste disposal company; and

(iii) Comply with local ordinances;

(c) When urinals are provided:

(i) There must be one urinal or two linear feet of urinal trough for each twenty-five men;

(ii) The floors and the walls surrounding a urinal and extending out at least fifteen inches on all sides must be constructed of materials which will not be adversely affected by moisture;

(iii) The urinal must have an adequate water flush where water under pressure is available; and

(iv) Urinal troughs are prohibited in pit privies.

(d) When pit privies are approved they must be:

(i) At least one hundred feet away from any sleeping room, dining room, cooking, or food-handling facilities; and

(ii) Constructed to exclude insects and rodents from the pit.

(2) Centralized toilet facilities. The operator must meet the following requirements when centralized toilet facilities are provided:

(a) Provide toilet rooms with:

(i) One toilet for every fifteen persons;

(ii) One handwashing sink for every six persons;

(iii) Either a window of at least six square feet opening directly to the outside, or be satisfactorily ventilated; and

(iv) All outside openings screened with sixteen-mesh material;

(b) Locate toilet rooms so that:

(i) Toilets are within two hundred feet of the door of each sleeping room; and

(ii) No person has to pass through a sleeping room to reach a toilet room.

(c) Maintain toilets in a clean and sanitary condition, cleaned at least daily;

(d) Provide each toilet compartment with an adequate supply of toilet paper;

(e) When shared facilities will be used for both men and women:

(i) Provide separate toilet rooms for each sex with a minimum of one toilet room for each sex and meet the required ratio as defined in (a) of this subsection;

(ii) Identify each room for "men" and "women" with signs printed in English and in the native language of the persons occupying the camp, or identified with easily understood pictures or symbols; and

(iii) Separate facilities by solid walls or partitions extending from the floor to the roof or ceiling when facilities for each sex are located in the same building.

(3) Individual family/unit dwelling toilet requirements. If providing flush toilets in individual cabins, apartments, or houses, the operator must:

(a) Provide one toilet for each individual family dwelling unit or fifteen persons;

(b) Provide one handwashing sink for each six persons. The sink must be located in the toilet room or immediately adjacent;

(c) Provide a window of at least six square feet opening directly to the outside, or be satisfactorily ventilated;

(d) Ensure all outside openings screened with sixteen-mesh material;

(e) Ensure toilet facilities are cleaned prior to occupancy and request occupants to maintain the facilities in a clean and sanitary condition.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16160, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16165 Cooking and food-handling facilities.** The operator must provide enclosed or screened cooking and food-handling facilities for all occupants. The operator must provide adequate tables and seating for occupants.

(1) If cooking facilities are located in dwelling units, the operator must provide:

(a) An operable cook stove or hot plate with at least one cooking surface for every two occupants;

(b) A sink with hot and cold running potable water under pressure;

(c) At least two (2) cubic feet of dry food storage space per occupant;

(d) Nonabsorbent, easily cleanable food preparation counters situated off the floor;

(e) Mechanical refrigeration conveniently located and able to maintain a temperature of forty-five degrees Fahrenheit or below, with at least two (2) cubic feet of storage space per occupant;

(f) Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;

(g) Nonabsorbent, easily cleanable floors; and

(h) Adequate ventilation for cooking facilities.

(2) In common food-handling facilities, the operator must provide:

(a) A room or building, adequate in size, separate from any sleeping quarters;

(b) No direct openings to living or sleeping areas from the common food-handling facility;

(c) An operable cook stove or hot plate with at least one cooking surface for every four occupants, or four cooking surfaces for every two families;

(d) Sinks with hot and cold running potable water under pressure;

(e) At least two (2) cubic feet of dry food storage space per occupant;

(f) Nonabsorbent, easily cleanable food preparation counters situated off the floor;

(g) Mechanical refrigeration conveniently located and able to maintain a temperature of forty-five degrees Fahrenheit or below, with at least two (2) cubic feet of storage space per occupant;

(h) Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;

(i) Nonabsorbent, easily cleanable floors; and

(j) Adequate ventilation for cooking facilities.

(3) The operator must ensure that centralized dining hall facilities comply with chapter 246-215 WAC, Food service.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16165, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16170 Cots, beds, bedding, and personal storage.** The operator must:

(1) Provide beds, cots, or bunks furnished with clean mattresses in good condition for the maximum occupancy approved by the department of health or health officer for operator-supplied housing;

(2) Maintain bedding, if provided by the operator, in a clean and sanitary condition;

(3) Provide sufficient clearance between each cot, bed or bunk and the floor or a commercially available cot, bed, or bunk;

(4) Allow space to separate beds laterally and end-to-end by at least thirty-six inches when single beds are used;

(5) Meet the following requirements when bunk beds are used:

(a) Allow space to separate beds laterally and end-to-end by at least forty-eight inches;

(b) Maintain a minimum space of twenty-seven inches between the upper and lower bunks; and

(c) Prohibit triple bunks; and

(6) Provide storage facilities for clothing and personal articles in each room used for sleeping.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16170, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16175 First aid and safety.** The operator must:

(1) Comply with chapters 15.58 and 17.21 RCW and chapters 16-228 and 296-307 WAC, Parts I and J, and pesticide label instructions when using pesticides in and around the housing;

(2) Prohibit, in the housing area, the use, storage, and mixing of flammable, volatile, or toxic substances other than those intended for household use;

(3) Provide readily accessible first-aid equipment;

(4) Ensure that a first-aid qualified person is readily accessible to administer first aid at all times;

(5) Store or remove unused refrigerator units to prevent access by children.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16175, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16180 Refuse disposal.** The operator must:

(1) Comply with local sanitation codes for removing and disposing of refuse from housing areas;

(2) Protect against rodent harborage, insect breeding, and other health hazards while storing, collecting, transporting, and disposing of refuse;

(3) Store refuse in fly-tight, rodent-tight, impervious, and cleanable or single-use containers;

[Title 296 WAC—p. 2422]

(4) Keep refuse containers clean;

(5) Provide a container on a wooden, metal, or concrete stand within one hundred feet of each dwelling unit;

(6) Empty refuse containers at least twice each week, and when full.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16180, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16185 Insect and rodent control.** The operator must take effective measures to prevent and control insect and rodent infestation.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16185, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16190 Disease prevention and control.** The operator must:

(1) Report immediately to the local health officer the name and address of any individual in the camp known to have or suspected of having a communicable disease;

(2) Report immediately to the local health officer:

(a) Suspected food poisoning;

(b) An unusual prevalence of fever, diarrhea, sore throat, vomiting, or jaundice; or

(c) Productive cough, or when weight loss is a prominent symptom among occupants;

(3) Prohibit any individual with a communicable disease from preparing, cooking, serving, or handling food, food-stuffs, or materials in dining halls.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16190, filed 3/1/00, effective 3/1/00.]

## Part L-1 Cherry Harvest Camps

### WAC 296-307-163 Cherry harvest camps.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-163, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16301 Purpose and applicability.** (1) Purpose. This part is adopted by the Washington state department of labor and industries, to implement the provisions of chapter 49.17 RCW and establish minimum health and safety requirements for cherry harvest camps.

(2) Applicability.

(a) This part applies only to operators of cherry harvest camps using tents during the cherry harvest season. Operators using other housing must refer to WAC 296-307-161, Part L, or chapter 246-358 WAC.

(b) Operators with ten or more occupants are required to be licensed under this part. Operators with nine or less employees are not required to be licensed, but must comply with these standards.

(c) For department of health licensing, on-site survey, and water test fees, see WAC 246-361-990.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16301, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16303 Definitions.** For the purposes of this part, the following words and phrases will have the fol-

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lowing meanings unless the context clearly indicates otherwise:

**"Building"** means any structure used or intended to be used for supporting or sheltering any use or occupancy that may include cooking, eating, sleeping, and sanitation facilities.

**"Cherry harvest camp"** or **"camp"** means a place, area, or piece of land where dwelling units or campsites are provided by an operator during the cherry harvest.

**"Common food-handling facility"** means an area designated by the operator for occupants to store, prepare, cook, and eat their own food supplies.

**"Current certificate (first aid)"** means a first-aid training certificate that has not expired.

**"Department"** means the Washington state department of health and/or the department of labor and industries.

**"Dining hall"** means a cafeteria-type eating place with food furnished by and prepared under the direction of the operator for consumption, with or without charge, by occupants.

**"Drinking fountain"** means a fixture equal to a nationally recognized standard or a designed-to-drain faucet, which provides potable drinking water under pressure. "Drinking fountain" does not mean a bubble-type water dispenser.

**"Dwelling unit"** means a shelter, building, or portion of a building, that may include cooking and eating facilities, which is:

- Provided and designated by the operator as either a sleeping area, living area, or both, for occupants; and
- Physically separated from other sleeping and common-use areas.

Note: For the purpose of this Part L1, a "tent" is considered a dwelling unit.

**"First-aid qualified"** means that the person holds a current certificate of first-aid training from the American Red Cross or another course with equivalent content or hours.

**"Food-handling facility"** means a designated, enclosed area for preparation of food.

**"Group A water system"** means a public water system and includes community and noncommunity water systems.

(a) A community water system means any Group A water system providing service to fifteen or more service connections used by year-round residents for one hundred eighty or more days within a calendar year, regardless of the number of people, or regularly serving at least twenty-five year-round (i.e., more than one hundred eighty days per year) residents.

(b) A noncommunity water system means a Group A water system that is not a community water system. Noncommunity water systems are further defined as:

(i) Nontransient (NTNC) water system that provides service opportunity to twenty-five or more of the same nonresidential people for one hundred eighty or more days within a calendar year.

(ii) Transient (TNC) water system that services:

- Twenty-five or more different people each day for sixty or more days within a calendar year;
- Twenty-five or more of the same people each day for sixty or more days, but less than one hundred eighty days within a calendar year; or

- One thousand or more people for two or more consecutive days within a calendar year.

**"Group B water system"** means a public water system:

(a) Constructed to serve less than fifteen residential services regardless of the number of people; or

(b) Constructed to serve an average nonresidential population of less than twenty-five per day for sixty or more days within a calendar year; or

(c) Any number of people for less than sixty days within a calendar year.

**"Health officer"** means the individual appointed as such for a local health department under chapter 70.05 RCW or appointed as the director of public health of a combined city-county health department under chapter 70.08 RCW.

**"Livestock"** means horses, cows, pigs, sheep, goats, poultry, etc.

**"Livestock operation"** means any place, establishment, or facility consisting of pens or other enclosures in which livestock is kept for purposes including, but not limited to, feeding, milking, slaughter, watering, weighing, sorting, receiving, and shipping. Livestock operations include, among other things, dairy farms, corrals, slaughterhouses, feedlots, and stockyards. Operations where livestock can roam on a pasture over a distance may be treated as outside the definition.

**"MSPA"** means the Migrant and Seasonal Agricultural Worker Protection Act (96 Stat. 2583; 29 U.S.C. Sec. 1801 et seq.).

**"Occupant"** means a temporary worker or a person who resides with a temporary worker at the campsite.

**"Operating license"** means a document issued annually by the department of health or contracted health officer authorizing the use of temporary worker housing.

**"Operator"** means a person holding legal title to the land on which the camp is located. However, if the legal title and the right to possession are in different persons, "operator" means a person having the lawful control or supervision over the camp.

**"Recreational park trailers"** means a trailer-type unit that is primarily designed to provide temporary living quarters for recreational, camping, or seasonal use, that meets the following criteria:

- Built on a single chassis, mounted on wheels;
- Having a gross trailer area not exceeding 400 square feet (37.15 square meters) in the set-up mode; and
- Certified by the manufacturer as complying with ANSI A119.5.

**"Recreational vehicle"** means a vehicular-type unit primarily designed as temporary living quarters for recreational camping, travel, or seasonal use that either has its own mode of power or is mounted on, or towed by, another vehicle. Recreational vehicles include: Camping trailers, fifth-wheel trailers, motor homes, travel trailers, and truck campers, but does not include pickup trucks with camper shells, canopies or other similar coverings.

**"Refuse"** means solid wastes, rubbish, or garbage.

**"Temporary worker"** means an agricultural employee employed intermittently and not residing year-round at the same site.

**"Tent"** means an enclosure or shelter constructed of fabric or pliable material composed of rigid framework to

support tensioned membrane that provides the weather barrier.

"WISHA" means the Washington Industrial Safety and Health Act, chapter 49.17 RCW, administered by the Washington state department of labor and industries.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-23-072, § 296-307-16303, filed 11/19/02, effective 1/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16303, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16305 Technical assistance.** An operator may request technical assistance from the department of health or the department of labor and industries to assist in compliance with this part.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16305, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16310 Operating license.** A cherry tent camp license is limited to one week before the commencement through one week following the conclusion of the cherry harvest within the state.

The operator:

(1) Must request a license from the department of health or health officer when:

- (a) The camp will house ten or more occupants;
- (b) Compliance with MSPA requires a license; or
- (c) Construction of camp buildings requires a license under chapter 246-359 WAC, Temporary worker housing construction standard.

(2) Must apply for an operating license at least forty-five days prior to either the use of the camp or the expiration of an existing operating license by submitting to the department of health or health officer:

(a) A completed application on a form provided by the department or health officer;

(b) Proof water system is current with all water tests required by chapter 246-290 or 246-291 WAC; and

(c) A fee as specified in WAC 246-361-990.

(3) Will receive an operating license for the maximum number of occupants as determined by WAC 246-361-030 when:

(a) The application requirements from subsection (2) of this section are met;

(b) The site is in compliance with this part as demonstrated by a licensing survey completed by the department; and

(c) The operator complies with the corrective action plan established by the department.

(4) Must post the operating license in a place readily accessible to workers.

(5) Must notify the department of health in the event of a transfer of ownership.

(6) Must cooperate with the department during on-site inspections.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-23-072, § 296-307-16310, filed 11/19/02, effective 1/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16310, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16315 Maximum camp occupancy.** The maximum occupancy for a camp will be based on:

(1) The number of shelters provided; and

(2) The number of bathing, food handling, handwashing, laundry, and toilet facilities.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16315, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16320 Variance and procedure.** Conditions may exist in operations that a state standard will not have practical use. The director of the department of labor and industries may issue a variance from the requirements of the standard when another means of providing equal protection is provided. The substitute means must provide equal protection in accordance with the requirements of chapter 49.17 RCW and chapter 296-350 WAC, variances.

Applications for variances will be reviewed and may be investigated by the department of labor and industries and the department of health. Variances granted will be limited to the specific case or cases covered in the application and may be revoked for cause. The variance must remain prominently posted on the premises while in effect.

Variance application forms may be obtained from the Department of Labor and Industries, P.O. Box 44625, Olympia, Washington 98504-4625 or the Department of Health, P.O. Box 47852, Olympia, Washington 98504-7852, upon request. Requests for variances from safety and health standards must be made in writing to the director or the assistant director, Department of Labor and Industries, P.O. Box 44625, Olympia, Washington 98504-4625. (Reference RCW 49.17.080 and 49.17.090.)

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16320, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16325 Cherry harvest campsites.** The operator must:

(1) Locate and operate a site to prevent a health or safety hazard that is:

(a) Adequately drained and any drainage from and through the camp must not endanger any domestic or public water supply;

(b) Free from periodic flooding and depressions in which water may become a nuisance;

(c) At least two hundred feet from a swamp, pool, sink hole, or other surface collection of water unless there is a mosquito prevention program for those areas;

(d) Large enough to prevent overcrowding of necessary structures. The principal camp area for sleeping and for food preparation and eating must be at least five hundred feet from where livestock are kept; and

(e) Maintained in a clean and sanitary condition.

(2) Develop and implement a cherry harvest camp management plan and rules for camps with ten or more occupants, to assure that the camp is operated in a safe and secure manner and is kept within the approved capacity. Additionally, the licensed operator must:

(a) Inform residents of the rules, in a language the resident understands by providing individual copies of the rules to each camp resident or posting the rules in the camp area; and

(b) Restrict the number of occupants in the camp to the capacity as determined by the department.

(3) When closing the camp permanently or for the season, complete the following:

- (a) Dispose of all refuse to prevent nuisance;
- (b) Fill all abandoned toilet pits with earth; and
- (c) Leave the grounds and buildings in a clean and sanitary condition.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16325, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16330 Water supply.** The operator must:

- (1) Provide a water system that is:
  - (a) Approved as a Group A public water system in compliance with chapter 246-290 WAC if the water system supplies fifteen or more connections or twenty-five or more people at least sixty days per year or provide proof the camp receives water from an approved Group A public water system; or
  - (b) Approved as a Group B water system in compliance with chapter 246-291 WAC if the water system supplies less than fifteen connections and does not supply twenty-five or more people at least sixty days per year.

Note: A "same farm exemption" applies to a public water system with four or fewer connections all of which serve residences on the same farm. "Same farm" means a parcel of land or series of parcels that are connected by covenants and devoted to the production of livestock or agricultural commodities for commercial purposes and does not qualify as a Group A water system.

	Avg. of less than 25 people	Avg. of 25 or more people
At least 60 days or more	Group B	Group A TNC
59 days or less	Group B	Group B

Note: If a system has 15 or more connections, regardless of the population, it is a Group A water system.

(2) Provide an adequate and convenient hot and cold water supply for drinking, cooking, bathing, and laundry purposes.

Note: An "adequate water supply" means the storage capacity of the potable water system must meet the requirements of ASHRAE 1999 Applications Handbook, chapter 48, Water Systems.

(3) Ensure that the distribution lines are able to maintain the working pressure of the water piping system at not less than fifteen pounds per square inch after allowing for friction and other pressure losses.

(4) When water is not piped to each dwelling unit, provide cold, potable, running water under pressure within one hundred feet of each dwelling unit.

(5) When water sources are not available in each individual tent, provide one or more drinking fountains for each one hundred occupants or fraction thereof. Prohibit the use of common drinking cups or containers from which water is dipped or poured.

(6) When water is unsafe for drinking purposes and accessible to occupants, post a sign by the source reading "Do not drink. Do not use for washing. Do not use for preparing food" printed in English and in the native language of the per-

sons occupying the camp, or marked with easily understood pictures or symbols.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16330, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16335 Sewage disposal.** An operator must:

- (1) Provide sewage disposal systems in accordance with local health jurisdictions.
- (2) Connect all drain, waste, and vent systems from buildings to:
  - (a) Public sewers, if available; or
  - (b) Approved on-site sewage disposal systems that are designed, constructed, and maintained as required in chapters 246-272 and 173-240 WAC, and local ordinances.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16335, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16340 Electricity and lighting.** (1) General electricity requirements.

- (a) The operator must supply electricity to all dwelling units, kitchen facilities, bathroom facilities, common areas, and laundry facilities.
- (b) All electrical wiring, fixtures and electrical equipment must comply with department of labor and industries regulations, chapter 19.28 RCW and local ordinances, and maintained in a safe condition.

(2) Electricity requirements in tents.

(a) Each individual tent must have at least one separate floor-type or wall-type convenience outlet. If the operator provides a refrigerator in the tent, a dedicated outlet must be provided for it.

(b) All electrical wiring and equipment installed in tents must meet the requirements of WAC 296-45-045.

(c) All electrical appliances to be connected to the electrical supply must meet the requirements for the load calculations as required by chapter 19.28 RCW.

(d) Electrical wiring exiting the tent to connect to the GFI outside outlet must be placed in approved flexible conduit not to exceed six feet in length.

(e) All wiring located inside the tent must be placed in conduit for protection and connected to a surface to secure the wiring to prevent movement. Wiring must be located to prevent tripping or safety hazards.

(f) Receptacles and lighting fixtures must be UL Listed and approved by the department for use in the tent.

(3) General lighting requirements.

(a) The operator must provide adequate lighting sufficient to carry on normal daily activities in all common use areas.

(b) Laundry and toilet rooms and rooms where people congregate must have at least one ceiling-type or wall-type fixture. Where portable toilets are used, lighting requirements can be met by area illumination.

(c) The operator must provide adequate lighting for safe passage for camp occupants to handwashing sinks and toilets.

(d) The operator must provide adequate lighting for shower rooms during hours of operation.

Note: Lighting requirements may be met by natural or artificial means.

(4) Lighting requirements in tents.

(a) Tents must have adequate lighting sufficient to carry on all normal daily activities. For example: Three 100-watt bulbs located at the top ridge of the frame and are UL Listed or equivalent.

(b) Each tent must have at least one ceiling-type light fixture.

(c) Food preparation areas, if located in the tent, must have at least one lighting fixture located to provide task lighting over the food preparation area.

(d) Alternate lighting appliances must provide adequate lighting. In addition, if using two or more propane, butane, or white gas lighting appliances, a carbon monoxide monitor must be provided and located not more than thirty inches from the floor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-16340, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16340, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16345 Tents.** (1) Tents must provide protection from the elements.

(2) Structural stability and floors.

(a) Tents and their supporting framework must be adequately braced and anchored to prevent weather related collapse. Documentation of the structural stability must be furnished to the department.

(b) Floors must be smooth, flat, and without breaks or holes to provide a hard, stable walking surface. Nonrigid flooring supported by grass, dirt, soil, gravel, etc., are not acceptable. Floors that are constructed of wood or concrete must comply with the building code, chapter 19.27 RCW or temporary worker housing construction standard, chapter 246-359 WAC.

(c) Floor systems must be designed to prevent the entrance of snakes and rodents.

(3) Flame-retardant treatments.

(a) The sidewalls, drops, and tops of tents must be composed of flame-resistant material or treated with a flame retardant in an approved manner.

(b) Floor coverings, which are integral to the tent, and the bunting must be composed of flame-resistant material or treated with a flame retardant in an approved manner and in accordance with Uniform Building Code, Standard 31.1.

(c) All tents must have a permanently affixed label bearing the following information:

(i) Identification of tent size and fabric or material type;

(ii) For flame-resistant materials, the necessary information to determine compliance with this section and National Fire Protection Association Standard 701, Standard Methods of Fire Tests for Flame-resistant Textiles and Films;

(iii) For flame-retardant materials, the date that the tent was last treated with an approved flame-retardant;

(iv) The trade name and type of flame-retardant utilized in the flame-retardant treatment; and

(v) The name of the person and firm that applied the flame retardant.

(4) Means of egress.

(a) At least one door must lead to the outside of the tent and the area designated for refuge must be accessible and remain clear of storage materials or hazards.

(b) The door must not be obstructed in any manner and must remain free of any material or matter where its presence would obstruct or render the exit hazardous.

(c) If cooking facilities are provided in tents, the window located opposite the door must have a means to open the window or provide an easily openable space. For example, a zipper which opens downward toward the floor.

(5) Floor area. The operator must:

(a) If cooking facilities are provided in the tent, provide at least seventy square feet of floor space for one occupant and fifty square feet for each additional occupant; or

(b) If cooking facilities are **not** provided in the tent, provide at least fifty square feet of floor space for each occupant in rooms used for sleeping purposes.

(6) Ceiling height.

(a) If the tent has a sloped ceiling, a ceiling height of at least seven feet is required in fifty percent of the total area.

(b) No portion of the tent measuring less than six feet from the flooring to the ceiling will be included in any computation of the minimum floor area.

(7) Windows and ventilation.

(a) Provide a window area equal to one-tenth of the total floor area in each habitable room which opens at least half-way or more directly to the outside for cross-ventilation and has sixteen-mesh screens on all exterior openings.

(b) The windows must have weather-resistant flaps, which will cover the window area and a means of fastening the flaps to provide protection from the elements and allow privacy for the occupants.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16345, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16350 Recreational vehicles.** The operator must ensure that all recreational vehicles and park trailers meet the requirements of chapters 296-150P and 296-150R WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16350, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16355 Laundry facilities.** An operator must:

(1) Provide one laundry tray or tub or one mechanical washing machine for every thirty persons;

(2) Provide facilities for drying clothes;

(3) Provide sloped, coved floors of nonslip impervious materials with floor drains;

(4) Maintain laundry facilities in a clean and sanitary condition.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16355, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16360 Handwashing and bathing facilities.** An operator must:

(1) Provide one handwash sink for every six persons in centralized facilities. Handwash sinks must be adjacent to toilets;

(2) Provide one showerhead for every ten persons in centralized facilities;

(3) Provide one "service sink" in each building used for centralized laundry, handwashing, or bathing;

- (4) Provide sloped, coved floors of nonslip impervious materials with floor drains;
- (5) Provide walls that are smooth and nonabsorbent to the height of four feet. If partitions are used, they must be smooth and nonabsorbent to the height of four feet;
- (6) Provide all showers, baths, and shower rooms with floor drains to remove wastewater;
- (7) Provide cleanable, nonabsorbent waste containers;
- (8) Maintain bathing and handwashing facilities in a clean and sanitary condition, cleaned at least daily;
- (9) Ensure shower facilities provide privacy from the opposite sex and the public;
- (10) Make showers and bathing facilities available when needed.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16360, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16365 Toilet facilities.** (1) General toilet requirements. Operators must provide flush toilets, chemical toilets, or pit privies. The department of health or health officer, according to requirements in chapter 246-272 WAC, must approve pit privies. The operator must comply with the following:

- (a) Flush toilets, chemical toilets, and urinals must not be located in any tent.
- (b) When chemical toilets are provided, they must be:
  - (i) Located at least fifty feet from any dwelling unit or food-handling facility;
  - (ii) Maintained by a licensed waste disposal company; and
  - (iii) Comply with local ordinances.
- (c) When urinals are provided:
  - (i) There must be one urinal or two linear feet of urinal trough for each twenty-five men;
  - (ii) The floors and walls surrounding a urinal and extending out at least fifteen inches on all sides must be constructed of materials which will not be adversely affected by moisture;
  - (iii) The urinal must have an adequate water flush where water under pressure is available; and
  - (iv) Urinal troughs are prohibited in pit privies.
- (d) When pit privies are approved they must be:
  - (i) At least one hundred feet away from any dwelling unit or food-handling facility; and
  - (ii) Constructed to exclude insects and rodents from the pit.

(2) Centralized toilet facilities. The operator must meet the following requirements when centralized toilet facilities are provided:

- (a) Provide toilet rooms with:
  - (i) One toilet for every fifteen persons;
  - (ii) One handwashing sink for every six persons;
  - (iii) Either a window of at least six square feet opening directly to the outside, or be satisfactorily ventilated; and
  - (iv) All outside openings screened with sixteen-mesh material.
- (b) Locate toilet rooms so that:
  - (i) Toilets are within two hundred feet of the door of each tent; and
  - (ii) No person has to pass through a sleeping room to reach a toilet room;

(2007 Ed.)

- (c) Maintain toilets in a clean and sanitary condition, cleaned at least daily;
- (d) Provide each toilet compartment with an adequate supply of toilet paper;
- (e) When shared facilities will be used for both men and women:
  - (i) Provide separate toilet rooms for each sex with a minimum of one toilet room for each sex and meet the required ratios as defined in (a) of this subsection;
  - (ii) Identify each room "men" and "women" with signs printed in English and in the native language of the persons occupying the camp, or identified with easily understood pictures or symbols; and
  - (iii) Separate facilities by solid walls or partitions extending from the floor to the roof or ceiling when facilities for each sex are located in the same building.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16365, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16370 Cooking and food-handling facilities.** The operator must provide enclosed or screened cooking and food-handling facilities for all occupants. The operator must provide adequate tables and seating for occupants.

- (1) If the operator provides cooking facilities in tents, the operator must provide:
  - (a) An operable cook stove or hot plate with at least one cooking surface for every four occupants;
  - (b) A sink with hot and cold running potable water under pressure at each tent site;
  - (c) At least two cubic feet of dry food storage space per occupant;
  - (d) Nonabsorbent, easily cleanable food preparation counters situated off the floor;
  - (e) Mechanical refrigeration conveniently located and able to maintain a temperature of forty-five degrees Fahrenheit or below, with at least one cubic foot of storage space per occupant; and
  - (f) Adequate ventilation for cooking facilities.
- (2) If the operator provides common food-handling facilities, the operator must provide:
  - (a) A room or building, adequate in size, separate from any tent;
  - (b) No direct openings to living or sleeping areas from the common food-handling facility;
  - (c) An operable cook stove or hot plate with at least one cooking surface for every four occupants, or four cooking surfaces for every two families;
  - (d) Sinks with hot and cold running potable water under pressure;
  - (e) At least two cubic feet of dry food storage space per occupant;
  - (f) Nonabsorbent, easily cleanable food preparation counters situated off the floor;
  - (g) Mechanical refrigeration conveniently located and able to maintain a temperature of forty-five degrees Fahrenheit or below, with at least one cubic foot of storage space per occupant;
  - (h) Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;
  - (i) Nonabsorbent, easily cleanable floors; and

[Title 296 WAC—p. 2427]

(j) Adequate ventilation for cooking facilities.

(3) The operator must ensure that dining hall facilities comply with chapter 246-215 WAC, Food service.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16370, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16375 Cots, beds, bedding, and personal storage.** The operator must provide cots, beds, or bunks for each occupant, not to exceed the maximum occupancy approved by the department or health officer.

(1) Beds or bunks must be furnished with clean mattresses and maintained in a clean and sanitary condition.

(2) The operator must:

(a) Provide sufficient clearance between each cot, bed, or bunk and the floor or a commercially available cot, bed, or bunk; and

(b) Allow space to separate beds laterally and end-to-end by at least thirty-six inches when single beds are used.

(3) When bunk beds are used the operator must:

(a) Allow space to separate beds laterally and end-to-end by at least forty-eight inches; and

(b) Maintain a minimum space of twenty-seven inches between the upper and lower bunks.

(4) Locate cots, beds, or bunks at least thirty inches or more from cooking surfaces.

(5) The use of triple bunk beds is prohibited.

(6) The operator must provide suitable storage facilities for clothing and personal articles in each tent.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16375, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16380 First aid and safety.** The operator must:

(1) Comply with chapters 15.58 and 17.21 RCW and chapters 16-228 and 296-307 WAC, Part I and J, and pesticide label instructions when using pesticides in and around the camp;

(2) Prohibit, in the housing area, the use, storage, and mixing of flammable, volatile, or toxic substances other than those intended for household use;

(3) Provide readily accessible first-aid equipment;

(4) Ensure that a first-aid qualified person is readily accessible to administer first aid at all times;

(5) Store or remove unused refrigerator units to prevent access by children.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16380, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16385 Refuse disposal.** The operator must:

(1) Comply with local sanitation codes for removing refuse from camp areas and disposing of refuse;

(2) Protect against rodent harborage, insect breeding, and other health hazards while storing, collecting, transporting, and disposing of refuse;

(3) Store refuse in fly-tight, rodent-tight, impervious, and cleanable or single-use containers;

(4) Keep refuse containers clean;

(5) Provide a container on a wooden, metal, or concrete stand within one hundred feet of each dwelling unit;

[Title 296 WAC—p. 2428]

(6) Empty refuse containers at least twice each week, and when full.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16385, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16390 Insect and rodent control.** The operator must take effective measures to prevent and control insect and rodent infestation.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16390, filed 3/1/00, effective 3/1/00.]

**WAC 296-307-16395 Disease prevention and control.** The operator must:

(1) Report immediately to the local health officer the name and address of any individual in the camp known to have or suspected of having a communicable disease;

(2) Report immediately to the local health officer:

(a) Suspected food poisoning;

(b) An unusual prevalence of fever, diarrhea, sore throat, vomiting, or jaundice; or

(c) Productive cough, or when weight loss is a prominent symptom among occupants.

(3) Prohibit any individual with a communicable disease from preparing, cooking, serving, or handling food, food-stuffs, or materials in dining halls.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050 and 1999 c 374. 00-06-081, § 296-307-16395, filed 3/1/00, effective 3/1/00.]

## INDOOR OPERATIONS

### Part M

#### Guarding Tools and Equipment; Farm Shops; Materials Handling

**WAC 296-307-18005 How must fan blades be guarded?** You must guard the blades of a fan located less than seven feet above the floor or working level. The guard must have maximum openings of one-half inch.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-18005, filed 12/1/98, effective 3/1/99.]

**WAC 296-307-18010 How must constant-running drives be guarded?** Shields, guards, and access doors that will prevent accidental contact with rotating machine parts on constant-running drives must be in place when the machine is running.

EXCEPTION: This requirement does not apply to combines when guards could create fire hazards.

"Constant-running drives" means drives that continue to rotate when the engine is running and all clutches are disengaged.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-18010, filed 12/1/98, effective 3/1/99.]

**WAC 296-307-18015 What training must an employer provide for employees who use agricultural equipment?** At the time of initial assignment and at least annually thereafter, you must instruct every employee in the safe operation and servicing of all equipment that the employee will use, including at least the following:

(2007 Ed.)

(1) Keep all guards in place when the machine is in operation.

(2) Only persons required for instruction or machine operation may ride on equipment, unless a passenger seat or other protective device is provided.

(3) Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unclogging the equipment.

EXCEPTION: When the machine must be running to be properly serviced or maintained, you must instruct employees in the steps and procedures necessary to safely service or maintain the equipment.

(4) Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

(5) Lock out electrical power before performing maintenance or service on farmstead equipment.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18015, filed 12/1/98, effective 3/1/99.]

**WAC 296-307-18020 What requirements apply to machine controls?** (1) If machine operation requires the presence of an operator on the machine, a "stop button" must be provided on the machine within reach of the operator.

(2) Power control devices must be marked to indicate the function and machine they control. "On" and "off" must be marked.

(3) "Stop" buttons must be red or orange. Each machine must have one or more stop buttons according to the working position of the operators.

(4) Power control devices must be located or guarded to prevent unexpected or accidental movement of the control. "Start" buttons must be recessed.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18020, filed 12/1/98, effective 3/1/99.]

**WAC 296-307-18025 How must steam pipes be guarded?** (1) All steam pipes or pipes hot enough to burn a person (other than coil pipes, radiators for heating rooms or buildings, or pipes on portable steam engines and boilers) must be guarded with a standard safeguard, unless guarded by location.

(2) All exposed hot pipes within seven feet of the floor or working platform, or within fifteen inches measured horizontally from stairways, ramps, or fixed ladders, must be covered with insulating material or be guarded to prevent contact.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18025, filed 12/1/98, effective 3/1/99.]

#### **WAC 296-307-185 Guarding powered saws.**

[97-09-013, recodified as § 296-307-185, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-185, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-18503 What general requirements apply to powered saws?** (1) You must ensure that all cracked saw blades are removed from service, except as indicated in WAC 296-307-18515(6).

(2) Inserting a wedge between a saw disk and its collar to form a "wobble saw" for rabbeting or dadoing is prohibited.

(2007 Ed.)

EXCEPTION: This does not apply to properly designed adjustable rabbeting blades.

(3) You must provide and ensure that employees use push sticks or push blocks in sizes and types suitable for the work to be done.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18503, filed 12/1/98, effective 3/1/99, 97-09-013, recodified as § 296-307-18503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-18503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-18506 How must band saws be guarded?** (1) You must ensure that all band wheels are completely encased or guarded on both sides. Guards must be constructed of at least No. 14 U.S. gauge metal, nominal two-inch wood material, or mesh or perforated metal of at least U.S. gauge No. 20 with maximum openings of three-eighths inch.

(2) You must ensure that all nonworking portions of the band saw blade are enclosed or guarded. The working side of the blade between the guide and the table may be left open to work on the stock.

(3) You must ensure that the guard for the portion of the blade between the sliding guide and the upper-saw-wheel guard protects the saw blade at the front and outer side.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18506, filed 12/1/98, effective 3/1/99, 97-09-013, recodified as § 296-307-18506, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-18506, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-18509 How must radial arm saws be guarded?** (1) You must ensure that the upper hood completely encloses the upper portion of the blade, including the end of the saw arbor. The upper hood must be constructed to protect the operator from flying material, and to deflect sawdust. The sides of the lower exposed portion of the blade must be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock. You may use an alternative lower blade guard if it provides equivalent protection.

(2) You must provide an adjustable stop to prevent the forward travel of the blade beyond the position necessary to complete the cut.

(3) You must equip a radial arm-saw with a mechanism to return the saw and keep it in position at the back of the table or behind the rip fence.

For example: You may use a counter-weight or a saw retractor device, or tilt the front of the radial arm saw unit up enough to maintain the blade at the back of the table or behind the rip fence when the pull handle is released by the operator.

(4) You must ensure that ripping and ploughing are permitted only against the direction in which the saw turns. Mark the direction of the saw rotation on the hood, and attach a permanent warning sign to the rear of the guard that prohibits ripping or ploughing from that position. (Where the blade teeth exit the upper hood when set up for ripping would be the rear of the saw in this case.) Each radial arm saw used for ripping must be provided with antikickback fingers or dogs to prevent the saw from throwing the material or stock back at the operator.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18509, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-18509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-18509, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-18512 How must table saws be guarded?** (1) You must ensure that each circular blade table saw used for ripping or crosscutting is guarded by a standard hood that covers the saw blade above the material completely at all times during the cut. The hood must adjust itself automatically to the thickness of, and must remain in contact with, the material being cut.

EXCEPTION: When finished surfaces of stock may be marred by the guard, it may be raised slightly to avoid contact. The hood must be designed to protect the operator from flying material.

- (2) You must ensure that any table saw used for ripping has antikickback fingers or dogs and a spreader.
- (3) While used for rabbeting, ploughing, grooving or dadoing a table saw may be used without an antikickback device and a spreader. Upon completion, the antikickback device and spreader must be replaced immediately.
- (4) You must ensure that the part of the table saw that is beneath the table is fully guarded to prevent employee contact with the portion of the blade below the table.
- (5) Power transmission components of table saws must be guarded according to WAC 296-307-280.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18512, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-18512, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-18512, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-18515 How must circular fuel-wood saws be guarded?** (1) You must ensure that fuel-wood saws are guarded by a standard guard that completely encloses the blade to the depth of the teeth, except for the area where material is fed into the blade.

- (2) You must ensure that the tables of fuel-wood saws is constructed so that material being sawed is supported on both sides of the blade.
- (3) You must provide a mechanism that will prevent the leading edge of the saw from passing the front edge of the table or roll case.
- (4) You must provide tilting tables of fuel-wood saws with a backrest for the full length of the table. The backrest must extend upward from the table platform at least to the height of the saw opening. An opening in a backrest must be a maximum of two inches. The backrest frame and filler must be constructed of material strong and rigid enough to prevent distortion under normal use.
- (5) Power transmission components of fuel-wood saws must be guarded according to WAC 296-307-280.
- (6) When a circular fuel-wood saw blade develops a crack, you must discontinue its use until properly repaired, according to the following measurements.

Length of crack	Diameter of saw in inches
1/2"	12"
1"	24"
1-1/2"	36"

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18515, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-18515, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-18515, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-190 Guarding bench grinders, abrasive wheels, and portable grinders.**

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-190, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-190, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-190, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-19003 What definitions apply to this section?** "Abrasive wheel" means a cutting tool consisting of abrasive grains held together by organic or inorganic bonds. This includes diamond and reinforced wheels.

"Flanges" means collars, discs, or plates between which wheels are mounted. Also referred to as adapter, sleeve, or back.

"Mounted wheels" means wheels of various dimensions that are usually 2 inches in diameter or smaller. They can be either organic or inorganic bonded abrasive wheels. They are secured to plain or threaded steel mandrels.

"Off-hand grinding" means grinding material or a part that is held in the operator's hand.

"Portable grinding" means the grinding machine is hand-held and may be easily moved from one location to another.

"Reinforced wheels" means a class of organic wheels that contain strengthening fabric or filament. "Reinforced" does not mean wheels using such mechanical additions as steel rings, steel cup backs, or wire or tape winding.

"Safety guard" means an enclosure designed to restrain the pieces of the grinding wheel and protect the operator in the event that the wheel is broken in operation.

[97-09-013, recodified as § 296-307-19003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-19003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-19006 What rules apply to guarding abrasive wheels?** (1) Abrasive wheels must be used only on machines provided with safety guards.

EXCEPTION: This requirement does not apply to the following:

- (a) Wheels used for internal work while the wheel is within the work being ground.
- (b) Mounted wheels 2 inches and smaller in diameter, used in portable operations.
- (c) Types 16, 17, 18, 18R, and 19 cones, plugs, and threaded hole pot balls where the work offers protection.
- (d) Specially shaped "sickle grinding" wheels mounted in mandrel-type bench or floor stands.

(2) The safety guard must cover the spindle end, nut, and flange projections.

- EXCEPTIONS:
- (a) When the work provides protection to the operator, the spindle end, nut, and outer flange may be exposed. When the work entirely covers the side of the wheel, the side covers of the guard may be omitted.
  - (b) The spindle end, nut, and outer flange may be exposed on portable machines designed for, and used with, type 6, 11, 27, and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels.
  - (c) The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(3) The guard must cover the sides and periphery of the wheel.

- EXCEPTIONS:
- (a) Bench and floor stands;
    - (i) The maximum permissible angle of exposure is 90°. This exposure must begin at a point not more than 65° above the horizontal plane of the wheel spindle.
    - (ii) Wherever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure must not exceed 125°. This exposure must begin at a point not more than 65° above the horizontal plane of the wheel spindle.
  - (b) Swing-frame grinders may only be exposed on the bottom half; the top half of the wheel must be enclosed at all times.
  - (c) Where the work is applied to the top of the wheel, the exposure of the grinding wheel periphery must not exceed 60°.
  - (d) When the work entirely covers the side of the wheel, the side covers of the guard may be omitted.

(4) The safety guard must be mounted to maintain proper alignment with the wheel, and the strength of the fastenings must exceed the strength of the guard.

(5) Take care to see that the safety guard is properly positioned before starting the mounted wheel.

(6) Abrasive wheel machinery guards must meet the design specifications of ANSI B7.1-1970.

(7) Exception: WAC 296-307-19006 does not apply to natural sandstone wheels and metal, wooden, cloth, or paper discs, with a layer of abrasive on the surface.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-19006, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-19006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-19006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-19009 What are the use, mounting, and guarding rules for abrasive wheels?** (1) Immediately before mounting, the operator must closely inspect and sound (ring test) all wheels to make sure they are not damaged. Before mounting the wheel, the operator must check the spindle speed of the machine to be certain that it does not exceed the maximum operating speed marked on the wheel.

"Ring test" means to tap the wheel gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels.

(2) Grinding wheels must fit freely on the spindle and remain free under all grinding conditions. The wheel hole must be made suitably oversized to ensure that heat and pressure do not create a hazard.

(3) All contact surfaces of wheels, blotters, and flanges must be flat and free of foreign matter.

(4) Bushings used in the wheel hole must not exceed the width of the wheel and must not contact the flanges.

(5) On offhand grinding machines, work rests must be used to support the work. The work rest must be rigid and adjustable to compensate for wheel wear. Work rests must be kept adjusted closely to the wheel with a maximum opening of one-eighth inch to prevent the work from jamming between the wheel and the rest. The work rest must be securely clamped after each adjustment and shall not be adjusted with the wheel in motion.

(6) Goggles or face shields must be used when grinding.

(2007 Ed.)

(7) Nonportable grinding machines must be securely mounted on substantial floors, benches, foundations, or other adequate structures.

(8) After mounting, abrasive wheels must be run at operating speed with the safety guard in place and properly adjusted, or in a protected enclosure for at least one minute before applying work. During this time, no one may stand in front of or in line with the wheel.

(9) Grinders or abrasive wheels that vibrate or are out of balance must be repaired before use.

(10) Abrasive wheels not designed for the machine or guard must not be mounted on a grinder.

(11) Side grinding must only be performed with wheels designed for this purpose.

Note: Light grinding on the side of straight wheels is permitted only when very delicate pressure is applied.

(12) Where the operator may stand in front of the opening, safety guards must be adjustable to compensate for wheel wear. The distance between the wheel periphery and the adjustable tongue or the guard above the wheel must not exceed one-quarter inch.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-19009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-19009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-19009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-19012 What requirements apply to flanges?** (1) Grinding machines must have flanges.

(2) All abrasive wheels must be mounted between flanges that are at least one-third the diameter of the wheel. Regardless of flange type used, the wheel must always be guarded. Blotters must be used according to this section.

(3) Design and material requirements include:

(a) Flanges must be designed to transmit the driving torque from the spindle to the grinding wheel.

(b) Flanges must be made of steel, cast iron, or other material of equal or greater strength and rigidity.

(4) An abrasive wheel that is designed to be held by flanges must not be operated without them. Except for those types requiring flanges of a special design, flanges must be at least one-third the diameter of the wheel.

(5) Facings of compressible material (blotters) must be inserted between the abrasive wheel and flanges to ensure uniform distribution of flange pressure.

(6) All flanges must be maintained in good condition. When the bearing surfaces become damaged, they should be trued or refaced. When refacing or truing, exercise care to make sure that proper relief and rigidity is maintained before starting the wheel.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-19012, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-19012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-19012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-19015 How must vertical portable grinders be guarded?** Safety guards on right angle head or vertical portable grinders must have a maximum exposure angle of 180°, and the guard must be between the operator and the wheel during use. The guard must be adjusted so that

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pieces of an accidentally broken wheel will be deflected away from the operator.

[97-09-013, recodified as § 296-307-19015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-19015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-19018 How must other portable grinders be guarded?** Other portable grinding machines must be guarded so that only the bottom half of the wheel is exposed. The top half of the wheel must be enclosed at all times.

[97-09-013, recodified as § 296-307-19018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-19018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-195 What rules apply to grounding and "dead man" controls for hand-held portable power tools?** (1) Each hand-held, power-driven tool must have a "dead man" control, such as a spring-actuated switch, valve, or equivalent device, so that the power will be automatically shut off whenever the operator releases the control.

(2) The frames and all exposed, noncurrent-carrying metal parts of portable electric machinery, operated at more than fifty volts to ground, must be grounded. Other hand-held portable motors driving electric tools must be grounded if they operate at more than fifty volts to ground. The ground must use a separate ground wire and polarized plug and receptacle.

Exception: Double insulated tools that are designed and used according to the requirements of Article 250-45 of the National Electrical Code (1971 edition) are exempt from the grounding requirements.

[97-09-013, recodified as § 296-307-195, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-195, filed 10/31/96, effective 12/1/96.]

### **WAC 296-307-200 Compressed air.**

[97-09-013, recodified as § 296-307-200, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-200, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-20005 May compressed air be used for cleaning?** Using compressed air for cleaning purposes is prohibited, except where the pressure is reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

[97-09-013, recodified as § 296-307-20005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-20005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-20010 What requirements apply to compressed air tools?** (1) When using compressed air tools, use care to prevent the tool from being shot from the gun.

(2) When momentarily out of use, the gun should be laid so that the tool cannot fly out if the pressure is accidentally released. When not in use, all tools should be removed from the gun.

(3) When disconnecting a compressed air tool from the air line, first shut off the pressure and then operate the tool to release the pressure remaining in the hose.

(4) Compressed air hose or guns must not be pointed at or brought into contact with the body of any person.

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[97-09-013, recodified as § 296-307-20010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-20010, filed 10/31/96, effective 12/1/96.]

### **WAC 296-307-205 Guarding portable powered tools.**

[97-09-013, recodified as § 296-307-205, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-205, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-20505 What requirements apply to guarding portable powered tools?** (1) All portable, power-driven circular saws with a blade diameter greater than 2 inches must have guards above and below the base plate or shoe.

(a) The upper guard must cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts.

(b) The lower guard must cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work.

(c) When the tool is withdrawn from the work, the lower guard must automatically and instantly return to covering position.

(2) Portable belt sanding machines must have guards at each nip point where the sanding belt runs onto a pulley. These guards must prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt must be guarded against accidental contact.

(3) Portable electric powered tools must meet the electrical requirements of chapter 296-307 WAC Part T.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-20505, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-20505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-20505, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-20510 What requirements apply to switches and controls on portable powered tools?** (1) The following powered tools must have a constant pressure switch or control that will shut off the power when the pressure is released:

- All hand-held powered circular saws with a blade diameter-greater than 2 inches;
- Electric, hydraulic or pneumatic chain saws; and
- Percussion tools without positive accessory holding means.

All hand-held gasoline powered chain saws must have a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.

(2) The following powered tools must have a constant pressure switch or control:

- All hand-held powered drills, tappers, fastener drivers, and horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter;
- Disc sanders with discs greater than 2 inches in diameter;
- Belt sanders;
- Reciprocating saws;
- Saber, scroll, and jig saws with blade shanks greater than a nominal 1/4 inch; and
- Other similarly operating powered tools.

(2007 Ed.)

These tools may have a lock-on control if they can be turned off by a single motion of the same finger or fingers that turn it on.

(3) The following powered tools must have either a positive on-off control, or other controls as described above:

- All other hand-held powered tools, including:
- Platen sanders;
- Grinders with wheels 2 inches in diameter or less;
- Disc sanders with discs 2 inches in diameter or less;
- Routers;
- Planers;
- Laminate trimmers;
- Nibblers;
- Shears; and
- Saber, scroll, and jig saws with blade shanks a nominal 1/4 inch wide or less.

(a) Saber, scroll, and jig saws with nonstandard blade holders may use blades with shanks that are nonuniform in width, if the narrowest portion of the blade shank is an integral part in mounting the blade.

(b) Blade shank width must be measured at the narrowest portion of the blade shank when saber, scroll, and jig saws have nonstandard blade holders.

(c) "Nominal" in this section means +0.05 inch.

(4) The operating control on hand-held power tools must be located to minimize the possibility of accidental operation that would constitute a hazard to employees.

Exception: This section does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, garden appliances, household and kitchen appliances, personal care appliances, or to fixed machinery.

[97-09-013, recodified as § 296-307-20510, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-20510, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-20515 What requirements apply to pneumatic powered tools and hose?** (1) The operating trigger on portable pneumatic powered tools must be located to minimize the possibility of accidental operation and arranged to close the air inlet valve automatically when the operator removes pressure.

(2) A tool retainer must be installed on each tool that would otherwise be ejected from the hose.

(3) Hose and hose connections used for conducting compressed air to utilization equipment must be designed for the pressure and service to which they are subjected.

[97-09-013, recodified as § 296-307-20515, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-20515, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-220 Power lawnmowers.**

[97-09-013, recodified as § 296-307-220, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-220, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22003 What definitions apply to this section?** "Blade tip circle" means the path described by the outermost point of the blade as it rotates about its shaft axis.

"Catcher assembly" means a part that provides a means for collecting grass clippings or debris.

(2007 Ed.)

"Deadman control" means a control designed to automatically interrupt power to a drive when the operator releases the control.

"Guard" means a part for shielding a hazardous area of a machine.

"Lowest blade position" means the lowest blade position when the mower is not in use.

"Operator area" (walk-behind mowers) means a circular area behind the mower that is no smaller than 30 inches in diameter, the center of which is 30 inches behind the nearest blade tip circle.

"Power reel mower" means a lawn-cutting machine with a power source that rotates one or more helically formed blades about a horizontal axis and creates a shearing action with a stationary cutter bar or bed knife.

"Power rotary mower" means a lawn-cutting machine with a power source that rotates one or more cutting blades about a vertical axis.

"Riding mower" means a powered, self-propelled lawn-cutting vehicle on which the operator rides and controls the machine.

"Sulky type mower" means a walk-behind mower that has been converted to a riding mower by the addition of a sulky.

"Walk-behind mower" means a mower either pushed or self-propelled and normally guided by the operator walking behind the unit.

[97-09-013, recodified as § 296-307-22003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22006 What are the general guarding requirements for power lawnmowers?** (1) Walk-behind, riding-rotary, and reel power lawnmowers designed for use by employees must meet the design specifications in ANSI B71.1-1968.

Exception: These specifications do not apply to sulky-type mowers, flail mowers, sickle-bar mowers, or mowers designed for commercial use.

(2) All power-driven chains, belts, and gears must be positioned or guarded to prevent accidental contact with the operator during normal starting, mounting, and operation of the machine.

(3) The motor must have a shutoff device that requires manual and intentional reactivation to restart the motor.

(4) All positions of the operating controls must be clearly identified.

(5) The words, "Caution — Be sure the operating control(s) is in neutral before starting the engine," or similar wording must be clearly visible at an engine starting control point on self-propelled mowers.

(6) All power lawn mowers must be used according to the manufacturer's instructions.

[97-09-013, recodified as § 296-307-22006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22009 What rules apply to walk-behind and riding rotary mowers?** (1) The mower blade must be enclosed except on the bottom and the enclosure must extend to or below the lowest blade position.

(2) Guards that must be removed to install a catcher assembly must meet the following requirements:

(a) Warning instructions are attached to the mower near the opening stating that the mower must not be used without either the catcher assembly or the guard in place.

(b) The mower is used only with either the catcher assembly or the guard in place.

(c) The catcher assembly is properly and completely installed.

(3) The word "caution" or stronger wording must be placed on the mower at or near each discharge opening.

(4) Blade(s) must stop rotating from the manufacturer's specified maximum speed within 15 seconds after declutching, or shutting off power.

[97-09-013, recodified as § 296-307-22009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22012 What rules apply to walk-behind rotary mowers?** (1) The horizontal angle of the grass discharge opening(s) in the blade enclosure must not contact the operator area.

(2) There must be one of the following at all grass discharge openings:

(a) A minimum of 3 inches between the end of the discharge chute and the blade tip circle; or

(b) A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.

(3) The highest point(s) on the blade enclosure front, except discharge-openings, must be a maximum of 1-1/4 inches above the lowest blade position. Mowers with a swingover handle are considered to have no front in the blade enclosure and therefore must comply with WAC 296-307-22009(1).

(4) The mower handle must be fastened to the mower to prevent loss of control by unintentional uncoupling while in operation.

(5) Mower handles must be locked in the normal operating position(s) so that they cannot be accidentally disengaged during normal mower operation.

(6) A swingover handle must meet the requirements of this section.

(7) Wheel drive disengaging controls, except deadman controls, must move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls may operate in any direction to disengage the drive.

(8) You must ensure that each walk-behind rotary mower has a positive constant-pressure device that requires the operator to hold the device in the "on" position to operate the mower. Using rope or string or other material to tie the constant pressure device in the "on" position is prohibited.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-22012, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-22012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22015 What rules apply to riding rotary mowers?** (1) The highest point(s) of all openings in

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the blade enclosure front must be a maximum of 1 1/4 inches above the lowest blade position.

(2) Opening(s) must not allow grass or debris to discharge directly toward the operator seated in normal operator position.

(3) There must be one of the following at all grass discharge openings:

(a) A minimum of 6 inches between the end of the discharge chute and the blade tip circle; or

(b) A rigid bar fastened across the discharge opening secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.

(4) Mowers must have stops to prevent jackknifing or locking of the steering mechanism.

(5) The mower must have brakes.

(6) Hand-operated wheel drive disengaging controls must move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls must be depressed to disengage the drive. Deadman controls, both hand and foot operated, may operate in any direction to disengage the drive.

[97-09-013, recodified as § 296-307-22015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22015, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-225 Jacks.**

[97-09-013, recodified as § 296-307-225, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-225, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22503 What definitions apply to this section?** "Jack" means an appliance for lifting and lowering or moving horizontally a load using a pushing force.

Note: Jack types include lever and ratchet, screw, and hydraulic.

"Rating" means the maximum working load for which a jack is designed to lift the load safely throughout its travel.

[97-09-013, recodified as § 296-307-22503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22506 How shall the rated load be marked on a jack?** (1) The operator must make sure that the jack used has a load rating sufficient to lift and sustain the load.

(2) The rated load must be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means.

Note: You should follow the manufacturer's specifications to raise the rated load of a jack.

[97-09-013, recodified as § 296-307-22506, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22506, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-22509 What rules apply to the operation and maintenance of jacks?** (1) If the foundation is not firm, you must block the base of the jack. If the cap might slip, you must place a block in between the cap and the load.

(2007 Ed.)

(2) The operator must watch the stop indicator, which must be kept clean, in order to determine the limit of travel. The indicated limit must not be overrun.

(3) After the load has been raised, it must immediately be cribbed, blocked, or otherwise secured. Working under a load raised only with jacks is prohibited.

(4) Hydraulic jacks exposed to freezing temperatures must be supplied with an adequate antifreeze liquid.

(5) All jacks must be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only lubricants recommended by the manufacturer should be used.

(6) You must ensure that each jack is thoroughly inspected according to the service conditions and at least:

(a) For constant or intermittent use at one locality, once every 6 months;

(b) For jacks sent out of shop for special work, when sent out and when returned;

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(7) Repair or replacement parts must be examined for possible defects.

(8) Jacks that are out of order must be tagged, and not be used until repaired.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-22509, filed 12/1/98, effective 3/1/99, 97-09-013, recodified as § 296-307-22509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-22509, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-230 What are the general requirements for materials handling and storage?** (1) Safe clearances of three feet must be allowed for aisles, loading docks, doorways, and wherever turns or passage must be made. Passageways must be kept clear and in good repair, with no obstructions.

(2) Bags, bales, boxes, and other containers stored in tiers must be made secure against sliding or collapse.

(3) Storage areas must be kept free from any accumulation of materials that could cause tripping, fire, or explosion.

(4) Employees must be instructed in proper lifting or moving techniques and methods. Mechanical devices or assistance in lifting must be used when moving heavy objects.

(5) When removing material stored in piles, employees must remove material in a manner that maintains the stability of the pile and prevents collapse.

(6) Storage areas must have proper drainage.

(7) You must provide clearance signs to warn of clearance limits.

(8) For powered industrial truck (forklift) requirements, see WAC 296-307-520.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-230, filed 12/1/98, effective 3/1/99, 97-09-013, recodified as § 296-307-230, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-230, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-232 What requirements apply to conveyors?** Conveyors must be constructed, operated, and maintained according to ANSI B 20.1-1957.

(2007 Ed.)

(1) When the return strand of a conveyor operates within seven feet of the floor, there must also be a trough strong enough to carry the weight resulting from a broken chain.

(2) If the strands are over a passageway, a means must be provided to catch and support the ends of the chain in the event of a break.

(3) When the working strand of a conveyor crosses within three feet of the floor level in passageways, a bridge must be provided for employees to cross over the conveyor.

(4) Whenever conveyors pass adjacent to or over working areas or passageways, protective guards must be installed. These guards must be designed to catch and hold any load or materials that may fall off or dislodge and injure an employee.

(5) Employees must be prohibited from walking on the rolls of roller-type conveyors. If employees must walk on roller-type conveyors because of an emergency, the conveyor must be shut off first.

(6) Guards, screens, or barricades that are strong enough to prevent material from falling must be installed on all sides of the shaftway of elevator-type conveyors except at openings where material is loaded or unloaded. Automatic shaftway gates or suitable barriers must be installed at each floor level where material is loaded or unloaded from the platform.

(7) Conveyors must have an emergency stopping device that can be reached from the conveyor. The device must be located near the material entrance to each chopper, mulcher, saw, or similar equipment. The device must be located so that it can stop the conveyor before an employee enters the point of operation of the machine fed by the conveyor.

EXCEPTION: The emergency stopping device is not required where the conveyor leading into the equipment is under constant control of an operator with full view of the material entrance and the conveyor is located where the operator cannot fall onto it.

(8) Where conveyors are over seven feet high, means must be provided to safely permit essential inspection and maintenance operations.

(9) Any part showing signs of significant wear must be inspected carefully and replaced before it creates a hazard.

(10) Replacement parts must be equal to or exceed the manufacturer's specifications.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-232, filed 12/1/98, effective 3/1/99, 97-09-013, recodified as § 296-307-232, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-232, filed 10/31/96, effective 12/1/96.]

## Part N

### Sanitation for Indoor Workplaces

**WAC 296-307-240 Sanitation for fixed, indoor workplaces.**

[97-09-013, recodified as § 296-307-240, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-240, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24001 Must an employer comply with state health regulations?** You must comply with the rules and regulations of the state board of health governing sanita-

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tion in the workplace. We enforce these regulations according to RCW 43.20.050.

[97-09-013, recodified as § 296-307-24001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24003 What does this section cover?**

WAC 296-307-240 covers sanitation for employees who normally work in fixed, indoor places of agricultural employment.

A "fixed, indoor workplace" is one where the employees perform a majority of their duties at that site.

This does not cover field employees who only occasionally enter a shop or other farm building as part of their normal duties. Field employees are covered by the field sanitation requirements of WAC 296-307-095.

This section does not cover measures for the control of toxic materials.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-24003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-24003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24006 What definitions apply to this section?** "Lavatory" means a basin used exclusively for washing hands, arms, face, and head.

"Personal service room" means a room used for activities not directly connected with the business function of the employer. Such activities include but are not limited to, first aid, medical services, dressing, showering, toilet use, washing, and eating.

"Potable water" means water that meets state or local quality standards for drinking water, or water that meets the quality standards of the Environmental Protection Agency's "National Interim Primary Drinking Water Regulations," published in 40 CFR, Part 141, and 40 CFR 147.2400.

"Toilet facility" means a fixture maintained within a toilet room for the purpose of defecation or urination, or both.

"Toilet room" means a room maintained within or on the premises of any place of employment, containing toilet facilities for employee use.

"Toxic material" means a material that exceeds a regulatory limit (such as in chapter 296-62 WAC), or toxicity that causes or is likely to cause death or serious physical harm.

"Urinal" means a toilet facility maintained within a toilet room for the sole purpose of urination.

"Water closet" means a toilet facility maintained within a toilet room for the purpose of both defecation and urination and which is flushed with water.

"Wet process" means any process or operation in a workroom that normally results in walking or standing surfaces becoming wet.

[97-09-013, recodified as § 296-307-24006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24009 What housekeeping requirements apply to fixed, indoor workplaces?** (1) You must ensure that all places of employment are kept clean to the extent that the work allows.

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(2) You must ensure that the floor of every workroom is kept as dry as possible. Where wet processes are used, you must maintain drainage. You must provide false floors, platforms, mats, or other dry standing places where practical, or provide appropriate waterproof footwear.

(3) To facilitate cleaning, every floor, working place, and passageway must be kept free from protruding nails, splinters, loose boards and unnecessary holes and openings.

(4) Cleaning and sweeping must be done to minimize dust in the air and when practical, done outside of working hours.

[97-09-013, recodified as § 296-307-24009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24012 How must the potable water supply be maintained?** (1) You must provide potable water in all places of employment, for drinking, washing of the person, cooking, washing food, washing cooking or eating utensils, washing food preparation or processing premises, and for personal service rooms.

(2) Potable drinking water dispensers must be maintained in sanitary condition, be closeable, and have a tap.

(3) Open containers for drinking water from which the water must be dipped or poured, even if fitted with a cover, are prohibited.

(4) A common drinking cup and other common utensils are prohibited.

[97-09-013, recodified as § 296-307-24012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24015 How must the nonpotable water supply be maintained?** (1) You must ensure that nonpotable water is marked as unsafe and is not used for drinking, washing of the person, cooking, washing food, washing cooking or eating utensils, washing food preparation or processing premises, or personal service rooms, or for washing clothes.

(2) Nonpotable water used for cleaning any other work premises must be free of concentrations of chemicals, fecal coliform, or other substances that could create unsanitary conditions or be harmful to employees.

(3) Nonpotable water systems or systems carrying any other nonpotable substance must be constructed to prevent backflow or backsiphonage into a potable water system.

[97-09-013, recodified as § 296-307-24015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24018 What toilet facilities must an employer provide?** (1) You must provide toilet facilities, with separate toilet rooms for each sex, according to the requirements in the table below. You must provide facilities for each sex based on the number of employees of that sex for whom facilities are furnished.

(2) Where single-occupancy rooms have more than one toilet facility, only one facility in each toilet room counts toward these requirements.

In this table, "number of employees" means the maximum number of employees present at any one time on a regular shift.

Number of employees	Minimum number of water closets
1 to 15	1
16 to 35	2
36 to 55	3
56 to 80	4
81 to 110	5
111 to 150	6
Over 150	One additional fixture for each additional 40 employees

(3) Where toilet rooms are occupied by one person at a time, can be locked from the inside, and contain at least one water closet, separate toilet rooms for each sex need not be provided.

(4) Where toilet facilities will not be used by women, urinals may be provided instead of water closets, except that the number of water closets must not be less than 2/3 of the minimum specified.

(5) The sewage disposal method must not endanger the health of employees.

(6) Toilet paper with holder must be provided for every water closet.

(7) Each water closet must occupy a separate compartment with a door and walls or partitions between fixtures high enough to ensure privacy.

[97-09-013, recodified as § 296-307-24018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24021 What washing facilities must an employer provide?** You must provide facilities for maintaining personal cleanliness in the workplace. The facilities must be convenient for employees and maintained in a sanitary condition.

[97-09-013, recodified as § 296-307-24021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24024 What requirements apply to lavatories?** (1) You must ensure that lavatories are available in all workplaces.

(2) Each lavatory must have hot and cold running water, or tepid running water.

(3) You must provide hand soap or similar cleansing agent.

(4) You must provide individual hand towels, warm air blowers, or clean individual sections of continuous cloth toweling convenient to the lavatories.

[97-09-013, recodified as § 296-307-24024, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24024, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24027 When must an employer provide change rooms?** (1) Whenever employees are required by a WISHA standard to wear protective clothing because of

the possibility of contamination with toxic materials, you must provide change rooms with separate storage facilities for street clothes and for the protective clothing.

(2) If you provide work clothes for employees, they must be dry.

[97-09-013, recodified as § 296-307-24027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24030 What requirements apply to consumption of food and beverages in the workplace?** (1) This section applies to workplaces where employees may consume food, beverages, or both on the premises.

(2) No employee may consume food or beverages in a toilet room nor in any area exposed to a toxic material.

(3) If your workplace exposes employees to injurious dusts or other toxic materials, you must provide a separate lunchroom unless it is convenient for employees to lunch away from the premises. The size of the lunchroom must be based on the maximum number of persons using the room at one time, according to the following table.

Number of persons	Square feet per person
25 and less	13
26 - 74	12
75 - 149	11
150 and over	10

(4) You must provide receptacles of smooth, corrosion resistant, easily cleanable, or disposable materials for the disposal of waste food. You must provide enough receptacles to encourage their use and to prevent overfilling. Receptacles must be emptied at least once a working day and maintained in sanitary condition. Receptacles must have a solid tight-fitting cover unless sanitary condition can be maintained without a cover.

(5) No food or beverages may be stored in toilet rooms or in an area exposed to toxic material.

(6) All employee food service facilities and operations must follow sound hygienic principles. If all or part of the food service is provided, the food dispensed must be wholesome and free from spoilage. Food must be processed, prepared, handled, and stored so as to prevent contamination.

[97-09-013, recodified as § 296-307-24030, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24030, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24033 How must waste be stored and removed?** (1) You must ensure that any receptacle used for waste or garbage that may rot is constructed so that it does not leak and can be thoroughly cleaned and maintained in a sanitary condition. A receptacle must have a solid tight-fitting cover, unless it can be maintained in a sanitary condition without a cover. Receptacles designed to maintain sanitary condition may be used in place of this requirement.

(2) All sweepings, solid or liquid wastes, refuse, and garbage must be removed to avoid creating a health menace, and as often as necessary to maintain the workplace in a sanitary condition.

[97-09-013, recodified as § 296-307-24033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-24036 When must an employer have a vermin control program?** Every building with personal service, food preparation, or eating rooms must be constructed, equipped, and maintained to restrict infestation by rodents, insects, and other vermin. You must have a continuing and effective extermination program where vermin are present.

[97-09-013, recodified as § 296-307-24036, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24036, filed 10/31/96, effective 12/1/96.]

### Part O

#### Walking Working Surfaces; Fixed Industrial Stairs; Aerial Manlifts

**WAC 296-307-250 Walking working surfaces, elevated walkways, and platforms.**

[97-09-013, recodified as § 296-307-250, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-250, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25003 What definitions apply to this section?** "Floor hole" means an opening with the smallest dimension between one and 12 inches, in any floor, platform, pavement, or yard, through which materials may fall but not people. Examples are a belt hole, pipe opening, or slot opening.

"Floor opening" means an opening with the smallest dimension of 12 inches or more, in any floor, platform, pavement, or yard, through which people may fall. Examples are a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from this definition.

"Handrail" means a single bar or pipe supported on brackets from a wall or partition to furnish persons with a handhold in case of tripping.

"Platform" means a working space for people that is elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

"Runway" means a passageway used by people that is elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

"Standard railing" means a vertical barrier along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent people from falling.

"Standard strength and construction" means any construction of railings, covers, or other guards that meets the requirements of this section.

"Stair railing" means a vertical barrier along exposed sides of a stairway to prevent people from falling.

"Toeboard" means a vertical barrier at floor level along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent materials from falling.

"Wall hole" means an opening between one and 30 inches high, of any width, in any wall or partition, such as a ventilation hole or drainage scupper.

"Wall opening" means an opening at least 30 inches high and 18 inches wide, in any wall or partition, through which people may fall, such as a yard-arm doorway or chute opening.

[97-09-013, recodified as § 296-307-25003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25006 When may railings be omitted?** Railings may be omitted from sections of open-sided floors, platforms, or walkways where guard rails impair operations, if railings are replaced when they no longer impair operations.

[97-09-013, recodified as § 296-307-25006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25009 What protection must an employer provide for floor openings?** (1) Every stairway floor opening must be guarded by a standard railing constructed according to this section. The railing must guard all exposed sides (except the entrance to the stairway). Infrequently used stairways where traffic across the opening prevents using a fixed standard railing (as when located in aisle spaces, etc.), may use an alternate guarding method. In these cases, the guard must have a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at the entrance to the stairway).

(2) Every ladderway floor opening or platform must be guarded by a standard railing with standard toeboard on all exposed sides (except at the entrance to the opening). The passage through the railing must have either a swinging gate or offset so that a person cannot walk directly into the opening.

(3) Every hatchway and chute floor opening must be guarded by one of the following:

(a) A hinged floor opening cover of standard strength and construction with standard railings, or a permanent cover with only one side exposed. When the opening is not in use, the cover must be closed or the exposed side must be guarded at both the top and middle by removable standard railings.

(b) A removable railing with toeboard on a maximum of two sides of the opening and with fixed standard railings and toeboards on all other exposed sides. The removable railings must be kept in place when the opening is not in use and should be hinged or mounted to be easily replaced.

(4) When employees must feed material into any hatchway or chute opening, you must provide protection to prevent people from falling through the opening.

(5) When practical, the area under floor openings must be fenced off. Otherwise, the area must be plainly marked with yellow lines and telltales hanging within 5-1/2 feet of the ground or floor level.

(6) Where floor openings are used to drop materials from one level to another, audible warning systems must be installed and used to indicate to employees on the lower level when material is dropped.

(7) Every skylight opening and hole must be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.

(8) Every infrequently used pit and trapdoor floor opening must be guarded by a floor opening cover of standard strength and construction that should be hinged in place. When the cover is not in place, the pit or trap opening must be constantly attended or protected on all exposed sides by removable standard railings.

(9) Every manhole floor opening must be guarded by a standard manhole cover. The manhole cover may be left unhinged. When the cover is removed, the manhole opening must be constantly attended or protected by removable standard railings.

(10) Every temporary floor opening must have standard railings or must be constantly attended.

(11) Every floor hole that people can accidentally walk into must be guarded by either:

(a) A standard railing with standard toeboard on all exposed sides; or

(b) A floor hole cover of standard strength and construction that should be hinged in place. While the cover is not in place, the floor hole must be constantly attended or protected by a removable standard railing.

(12) Every floor hole surrounded by fixed machinery, equipment, or walls that prevent people from walking into it, must be protected by a cover that leaves openings a maximum of one inch wide. The cover must be securely held in place to prevent tools or materials from falling through.

(13) Where doors or gates open directly on a stairway, a platform must be provided so that the swing of the door does not reduce the platform width to less than 20 inches.

[97-09-013, recodified as § 296-307-25009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25012 What protection must an employer provide for wall openings and holes?** (1) Every wall opening from which there is a drop of more than 4 feet must be guarded by one of the following:

(a) A rail, roller, picket fence, half door, or equivalent barrier.

The guard may be removable but should be hinged or mounted so it can be easily replaced. When employees working below the opening are exposed to falling materials, a removable toeboard or the equivalent must also be provided. When the opening is unused, the guard must be kept in position even with a door on the opening. In addition, a grab handle must be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting.

(b) An extension platform onto which materials can be hoisted for handling, and that has side rails or equivalent guards of standard specifications.

(2) Every chute wall opening from which there is a drop of more than 4 feet must be guarded according to subsection (1) of this section or as required by the conditions.

(3) Every window wall opening at a stairway landing, floor, platform, or balcony, from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, must be guarded by standard slats, standard grillwork according to WAC 296-307-25042(3), or a standard railing.

(2007 Ed.)

Where the window opening is below the landing, or platform, a standard toeboard must be provided.

(4) Every temporary wall opening must have adequate guards that may be of less than standard construction.

(5) Where there is a hazard of materials falling through a wall hole, and the lower edge of the near side of the hole is less than 4 inches above the floor, and the far side of the hole is more than 5 feet above the next lower level, the hole must be protected by a standard toeboard or a solid enclosing screen, or according to WAC 296-307-25042(3).

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-25012, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-25012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25015 What protection must an employer provide for open-sided floors, platforms, and runways?**

(1) Every open-sided floor or platform 4 feet or more above an adjacent floor or ground level must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027) on all open sides, except where there is an entrance to a ramp, stairway, or fixed ladder. The railing must have a toeboard wherever, beneath the open sides:

(a) A person can pass; or

(b) There is moving machinery; or

(c) Materials falling onto equipment would create a hazard.

(2) Every runway must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027) on all open sides that are 4 feet or more above floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard must also be provided on each exposed side.

Runways used exclusively for special purposes (such as oiling, shafting, or filling tank cars) may have the railing on one side omitted when operating conditions require, if the hazard is minimized by using a runway at least 18 inches wide. Where people entering runways become exposed to machinery, electrical equipment, or hazards other than from falling, additional guarding may be necessary.

(3) Regardless of height, all open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, or similar hazardous equipment, must be guarded with a standard railing and toeboard.

(4) Tools and loose materials must not be left on overhead platforms and scaffolds.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-25015, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-25015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25018 What requirements apply to stairway railings and guards?** (1) Every flight of stairs having four or more risers must have standard stair railings or standard handrails as follows (stairway widths measured clear of all obstructions except handrails):

(a) Stairways less than 44 inches wide with both sides enclosed must have at least one handrail, preferably on the right side descending.

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(b) Stairways less than 44 inches wide with one side open must have at least one stair railing on the open side.

(c) Stairways less than 44 inches wide with both sides open must have one stair railing on each side.

(d) Stairways more than 44 inches wide but less than 88 inches wide must have one handrail on each enclosed side and one stair railing on each open side.

(e) Stairways 88 or more inches wide must have one handrail on each enclosed side, one stair railing on each open side, and one intermediate stair railing at the approximate middle.

Exception: Vehicle service pit stairways are exempt from this requirement if hand or stair rails would prevent vehicle movement into position over the pit.

(2) Winding stairs must have a handrail that prevents walking on all portions of the treads that are less than 6 inches wide.

(3) Nonindustrial and "monumental" steps are exempt from the requirements of this section. However, public and private building steps at loading or receiving docks, in maintenance areas, etc., and stairs used exclusively by employees, must meet the requirements of this section.

[97-09-013, recodified as § 296-307-25018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25021 How must a standard railing be constructed?** A standard railing must meet the following requirements:

(1) The railing has a top rail, intermediate rail, and posts.

(2) The railing height is between thirty-six and forty-two inches nominal from the upper surface of the top rail to the floor, platform, runway, or ramp level.

(3) The top rail is smooth.

(4) The intermediate rail is approximately halfway between the top rail and the floor, platform, runway, or ramp.

(5) The ends of the rails do not overhang the terminal posts except where the overhang does not create a hazard.

(6) Guardrails taller than 42 inches are constructed so they do not create a hazard. Additional mid-rails are installed so that openings beneath the top rail prevent a spherical object with a 19-inch or larger diameter from falling through.

[97-09-013, recodified as § 296-307-25021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25024 How must a stair railing be constructed?** A stair railing must be constructed similar to a standard railing. The stair railing must be between 34 and 30 inches tall measured from the top of the top rail to the tread surface meeting the face of the riser at the forward edge of the tread.

[97-09-013, recodified as § 296-307-25024, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25024, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25027 What are the requirements for railing dimensions?** Standard railings must meet the following requirements:

(1) For wood railings:

(a) The posts are of at least two inch by four inch nominal stock spaced six feet apart or less; and

(b) The top and intermediate rails are of at least two inch by four inch nominal stock.

(c) If the top rail is made of two right-angle pieces of 1-inch by 4-inch stock, posts are spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail.

(2) For pipe railings:

(a) The posts and top and intermediate railings are at least 1-1/2 inches nominal diameter (outside diameter); and

(b) The posts are spaced on centers of eight feet or less.

(3) For structural steel railings:

(a) The posts and top and intermediate rails are of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength; and

(b) The posts are spaced on centers of eight feet or less.

(4) Post anchors and framing parts for all railings are constructed so that the completed structure can withstand a load of at least two hundred pounds applied in any direction at any point on the top rail.

(5) Other types, sizes, and arrangements of railing construction that meet the following requirements are acceptable:

(a) The top rail is smooth;

(b) The top rail is between thirty-six and forty-two inches nominal above the floor, platform, runway, or ramp level;

(c) The railing is strong enough to withstand two hundred pounds of pressure on the top rail;

(d) The railing provides protection between the top rail and the floor, platform, runway, ramp, or stair treads, equivalent to that of a standard intermediate rail;

(e) There are no overhanging rail ends unless the overhang does not create a hazard; such as baluster railings, scrollwork railings, or paneled railings.

Note: The dimensions specified are based on the U.S. Department of Agriculture Wood Handbook, No. 72, 1955 (No. 1 (S4S) Southern Yellow Pine (Modulus of Rupture 7,400 psi)) for wood; ANSI G 41.5-1970, American National Standard Specifications for Structural Steel, for structural steel; and ANSI B 125.1-1970, American National Standard Specifications for Welded and Seamless Steel Pipe, for pipe.

[97-09-013, recodified as § 296-307-25027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25030 What requirements apply to toeboards?** (1) Standard toeboard height is at least four inches nominal from its top edge to the level of the floor, platform, runway, or ramp. The toeboard must be securely fastened in place and with a maximum of 1/4 inch clearance above floor level. It must be made of any substantial material that is either solid or with openings that are a maximum of one inch in diameter.

(2) Where material is piled high enough that a standard toeboard does not provide protection, paneling from the floor to the intermediate rail, or to the top rail, must be provided.

[97-09-013, recodified as § 296-307-25030, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25030, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25033 How must handrails and railings be constructed?** (1) A handrail must have a horizontal part mounted directly on a wall or partition by brackets attached to the lower side of the handrail. The brackets must be attached to ensure that there is a smooth surface along the top and both sides of the handrail. The handrail must be rounded or otherwise provide an adequate handhold for anyone grasping it to avoid falling. The ends of the handrail should be turned in to the supporting wall or arranged to prevent a projection hazard.

(2) Handrails must be a maximum of thirty-four inches high and at least thirty inches from the upper surface of the handrail to the surface of the tread in line with the face of the riser or to the surface of the ramp.

(3) The size of handrails must be:

(a) For hardwood, at least two inches in diameter.

(b) For metal pipe, at least 1-1/2 inches in diameter.

(4) Brackets must be spaced a maximum of eight feet apart.

(5) Handrail mounting must be strong enough to withstand a load of at least two hundred pounds applied in any direction at any point on the rail.

(6) All handrails and railings shall have a clearance of at least 1-1/2 inches between the handrail or railing and the wall or any other object.

[97-09-013, recodified as § 296-307-25033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25036 What materials may be used for floor opening covers?** Floor opening covers must be made of any material that meets the following strength requirements:

(1) Trench or conduit covers and their supports, when located in plant roadways, must be designed to carry a truck rear-axle load of at least 20,000 pounds.

(2) Manhole covers and their supports, when located in plant roadways, must meet local standard highway requirements if any; otherwise, they must be designed to carry a truck rear-axle of at least 20,000 pounds.

(3) Other floor opening covers must be made of any material that can carry a truck rear-axle load of at least 20,000 pounds. Covers may project a maximum of one inch above the floor level if all edges are chamfered to a maximum angle with the horizontal of thirty degrees. All hinges, handles, bolts, or other parts must set flush with the floor or cover surface.

[97-09-013, recodified as § 296-307-25036, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25036, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25039 How must skylight screens be constructed and mounted?** Skylight screens must be constructed and mounted to withstand a load of at least two hundred pounds applied perpendicularly anywhere on the screen. Skylight screen must be constructed and mounted so that, under ordinary loads or impacts, they will not deflect downward enough to break the glass below them. They must be constructed of grillwork with openings a maximum of four inches long or of slatwork with openings a maximum of two inches wide and any length.

(2007 Ed.)

[97-09-013, recodified as § 296-307-25039, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25039, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-25042 What protection must an employer provide for wall openings?** (1) Wall opening barriers (rails, rollers, picket fences, and half doors) must be constructed and mounted, to withstand a load of at least two hundred pounds applied in any direction (except upward) at any point on the top rail.

(2) Wall opening grab handles must be at least twelve inches long and must be mounted to give 1-1/2 inches clearance from the side framing of the wall opening. The size, material, and anchoring of the grab handle must form a structure that can withstand a load of at least two hundred pounds applied in any direction at any point of the handle.

(3) Wall opening screens must be constructed and mounted to withstand a load of at least two hundred pounds applied horizontally anywhere on the near side of the screen. They must be of solid construction, of grillwork with openings a maximum of four inches long, or of slatwork with openings a maximum of two inches wide and any length.

[97-09-013, recodified as § 296-307-25042, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25042, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-260 Fixed industrial stairs.**

[97-09-013, recodified as § 296-307-260, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-260, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26003 What does this section cover?** WAC 296-307-260 covers the safe design and construction of fixed general industrial stairs. Fixed general industrial stairs includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms, or pits.

This section does not apply to stairs used for fire exits, to construction operations, to private buildings or residences, or to articulated stairs that are installed on floating roof tanks or on dock facilities, where the angle changes with the rise and fall of the base support.

Stairs of public and private buildings at loading or receiving docks, in maintenance areas, etc., or stairs that are used exclusively by employees, are considered "fixed industrial steps" and must meet these requirements.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-26003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-26003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26006 What definitions apply to this section?** "Nose or nosing" means the part of a tread projecting beyond the face of the riser immediately below.

"Open riser" means the air space between the treads of stairways without risers.

"Platform" means an extended step or landing breaking a continuous run of stairs.

"Railing" means a vertical barrier erected along exposed sides of stairways and platforms to prevent people from falling. The top part of the railing usually serves as a handrail.

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"Rise" means the vertical distance from the top of a tread to the top of the next higher tread.

"Riser" means the upright part of a step at the back of a lower tread and near the leading edge of the next higher tread.

"Stairs or stairway" means a series of steps. A series of steps and landings having three or more risers constitutes stairs or a stairway.

"Tread" means the horizontal part of a step.

"Tread run" means the horizontal distance from the leading edge of a tread to the leading edge of an adjacent tread.

"Tread width" means the horizontal distance from front to back of tread, including nosing.

[97-09-013, recodified as § 296-307-26006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26009 Where are fixed stairs required?** Fixed stairs must be provided for:

(1) Employee access from one structure level to another where operations require regular travel between levels.

(2) Employee access to operating platforms on any equipment that requires regular attention during operations.

(3) Employees that need daily access to elevations, or access at each shift, for purposes such as gauging, inspection, regular maintenance, etc., where:

(a) The work may expose employees to acids, caustics, gases, or other harmful substances; or

(b) Employees must normally carry tools or equipment by hand.

Note: This section does not prohibit the use of fixed ladders for access to elevated tanks, towers, and similar structures, overhead traveling cranes, etc., where the use of fixed ladders is common practice.

[97-09-013, recodified as § 296-307-26009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26012 Where are spiral stairs prohibited?** Spiral stairways are prohibited except for special limited use and secondary access when a conventional stairway is not practical. Winding stairways may be installed on tanks and similar round structures where the diameter of the structure is a minimum of five feet.

[97-09-013, recodified as § 296-307-26012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26015 How strong must fixed stairs be?** Fixed stairways must be designed and constructed to carry a load of five times the normal live load anticipated, and must be at least strong enough to carry safely a moving concentrated load of 1,000 pounds.

[97-09-013, recodified as § 296-307-26015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26018 How wide must fixed stairs be?** Fixed stairways must be at least 22 inches wide.

[97-09-013, recodified as § 296-307-26018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26018, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2442]

**WAC 296-307-26021 What angles may stairways be installed at?** (1) Fixed stairs must be installed at angles to the horizontal of between thirty and fifty degrees. Any uniform combination of rise/tread dimensions may be used that will provide a stairway at an angle within the permissible range.

The following table lists examples of rise/tread dimensions that will produce a stairway within the permissible range. Rise/tread combinations are not limited to those in the table.

Angle to horizontal	Rise (in inches)	Tread run (in inches)
30°35'	6-1/2	11
32°08'	6-3/4	10-3/4
33°41'	7	10-1/2
35°16'	7-1/4	10-1/4
36°52'	7-1/2	10
38°29'	7-3/4	9-3/4
40°08'	8	9-1/2
41°44'	8-1/4	9-1/4
43°22'	8-1/2	9
45°00'	8-3/4	8-3/4
46°38'	9	8-1/2
48°16'	9-1/4	8-1/4
49°54'	9-1/2	8

(2) A permanent stairway may be installed at an angle above the fifty degree critical angle when space limitations require. Such installations (commonly called inclined ladders or ships ladders) must have handrails on both sides and open risers. They must be capable of sustaining a live load of one hundred pounds per square foot with a safety factor of four. The following preferred and critical angles from the horizontal are recommended for inclined ladders and ships ladders:

(a) 35 to 60 degrees—Preferred angle from horizontal.

(b) 60 to 70 degrees—Critical angle from horizontal.

[97-09-013, recodified as § 296-307-26021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26024 What requirements apply to stair treads?** (1) When risers are used, each tread and the top landing of a stairway should have a nose extending 1/2 to one inch beyond the face of the lower riser.

(2) Noses should have an even leading edge.

(3) All treads must be reasonably slip-resistant and the nosings must be of nonslip finish. Welded bar grating treads without nosings are acceptable if the leading edge can easily be identified by employees descending the stairway and the tread is serrated or is nonslip.

(4) Rise height and tread width must be uniform throughout any flight of stairs including any foundation structure used as one or more treads of the stairs.

[97-09-013, recodified as § 296-307-26024, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26024, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26027 What requirements apply to the length of stairways?** Long flights of stairs, unbroken by landings or intermediate platforms, should be avoided. You

should consider providing intermediate platforms where practical and for frequently used stairways. Stairway platforms must be at least as wide as the stairway and at least 30 inches long, measured in the direction of travel.

[97-09-013, recodified as § 296-307-26027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26030 What requirements apply to railings and handrails on fixed stairs?** Standard railings must be provided on the open sides of all exposed stairways and stair platforms. Handrails must be provided on at least one side of closed stairways, preferably on the right side descending. Stair railings and handrails must be installed according to WAC 296-307-250.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-26030, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-26030, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26030, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-26033 What requirements apply to alternating tread-type stairs?** "Alternating tread-type stairs" means stairs with a series of steps between 50 and 70 degrees from horizontal, attached to a center support rail in an alternating manner so that a user of the stairs never has both feet at the same level at the same time.

(1) Alternating tread-type stairs must be designed, installed, used, and maintained according to the manufacturer's specifications, and must have the following:

- (a) Stair rails on all open sides;
- (b) Handrails on both sides of enclosed stairs;
- (c) Stair rails and handrails that provide an adequate handhold for a user grasping it to avoid a fall;
- (d) A minimum of 17 inches between handrails;
- (e) A minimum width of 22 inches overall;
- (f) A minimum tread depth of 8 inches;
- (g) A minimum tread width of 7 inches; and
- (h) A maximum rise of 9 1/2 inches to the tread surface of the next alternating tread.

(2) Alternating tread-type stairs must have a maximum 20-foot continuous rise. Where more than a 20-foot rise is necessary to reach the top of a required stair, one or more intermediate platforms must be provided according to WAC 296-307-26027.

(3) Stairs and platforms must be installed so the top landing of the alternating tread stair is flush with the top of the landing platform.

(4) Stair design and construction must sustain a load of at least five times the normal live load, and be at least strong enough to carry safely a moving concentrated load of 1,000 pounds.

(5) Treads must have slip-resistant surfaces.

(6) Where a platform or landing is used, the width must be at least as wide as the stair and at least 30-inches deep in the direction of travel. Stairs must be flush with the top of the landing platform.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-26033, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-26033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26033, filed 10/31/96, effective 12/1/96.]

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**WAC 296-307-26036 What other requirements apply to fixed stairs?** (1) Vertical clearance above any stair tread to an overhead obstruction must be at least 7 feet measured from the leading edge of the tread.

(2) Stairs with treads less than 9 inches wide should have open risers.

(3) Open grating type treads are desirable for outside stairs.

[97-09-013, recodified as § 296-307-26036, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26036, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-270 Aerial manlift equipment.**

[97-09-013, recodified as § 296-307-270, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-270, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-27005 What requirements apply to aerial manlift equipment?** (1) We will accept safety factor test data on working or structural components from one of the following as evidence that a manlift meets minimum safety requirements:

- (a) The manufacturer;
- (b) A competent testing laboratory;
- (c) A registered engineering firm; or
- (d) A registered engineer.

If, after use, it appears doubtful whether this equipment will meet the above requirements, we may require that tests be conducted, and we may order that you make corrections.

(2) All aerial manlifts must have working brake systems.

(3) Automatic apertures must be installed in the hydraulic systems of aerial manlifts to maintain the boom in position in case any part of the hydraulic pressure system fails.

(4) Controls must be guarded by partial enclosures to minimize accidental contact.

(5) The manufacturer's recommended maximum load limit must be posted conspicuously near the controls and must be kept in a legible condition.

(6) All critical hydraulic and pneumatic components must meet the provisions of ANSI A92.2-1969, Section 4.9 Bursting Safety Factor. Critical components are those which, in case of failure, would cause a free fall or free rotation of the boom. All noncritical components must have a bursting safety factor of at least two to one.

[97-09-013, recodified as § 296-307-27005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-27005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-27010 What requirements apply to using aerial manlift equipment?** (1) The manufacturer's instructional manual, if any, must be used to establish the proper operational sequences and maintenance procedures. If there is no manual, you must develop instructions. The instructions must be available for reference by operators.

(2) The assigned operator must make a daily visual inspection and perform the tests recommended by the manufacturer.

(3) Only employees qualified by training or experience may operate aerial manlifts.

(4) Employees must report defective aerial manlift equipment to you as soon as identified. Using defective

equipment is prohibited when the defect may cause an accident.

(5) When moving to and from the job site, the basket of the manlift must be in the low position.

(6) Unsafe practices are prohibited, such as, sitting or standing on the basket edge, standing on material placed across the basket, or working from a ladder set inside the basket.

(7) The basket must not be rested on a fixed object so that the weight of the boom is supported by the basket.

(8) The employee and the aerial manlift equipment must maintain distance from high voltage lines according to WAC 296-307-150.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-27010, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-27010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-27010, filed 10/31/96, effective 12/1/96.]

### Part P Guarding Power Transmission Machinery

#### **WAC 296-307-280 Guarding power transmission machinery.**

[97-09-013, recodified as § 296-307-280, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-280, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28002 What power transmission belts are covered by this section?** WAC 296-307-280 covers all types and shapes of power transmission belts.

**EXCEPTION:** The following power transmission belts are exempt from WAC 296-307-280 when operating at 250 feet per minute or less:

- (1) Flat belts that are one inch wide or less.
- (2) Flat belts that are 2" wide or less and are free from metal lacings or fasteners.
- (3) Round belts that are 1/2" in diameter or less.
- (4) Single strand V-belts that are 13/32" wide or less.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28002, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28002, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28002, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28004 What does "guarded by location" mean?** "Guarded by location" means that the location of a component eliminates potential hazards. A component seven feet or more above a working surface is considered guarded by location.

[97-09-013, recodified as § 296-307-28004, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28004, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28006 What general requirements apply to machine guarding?** (1) All power transmission components must be guarded according to the requirements of this section.

(2) You must protect employees from coming into contact with moving machinery parts by:

- (a) A guard or shield or guarding by location; or
- (b) A guardrail or fence whenever a guard or shield or guarding by location is infeasible.

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(3) Strength and design of guards.

(a) Guards must be designed and located to prevent inadvertent contact with the hazard.

(b) Unless otherwise specified, each guard and its supports must be strong enough to withstand the force that a 250 pound person would exert leaning on or falling against the guard.

(c) Guards must be securely fastened to the equipment or building.

(4) A guard or shield on stationary equipment must be provided at the mesh point or pinch point where the chain or belt contacts the sprocket or pulley.

(5) Machines that will throw stock, material, or objects must be covered or provided with a device designed and constructed to minimize this action. (Machines such as rip saws, rotary mowers and beaters, rotary tillers are included in this classification.)

(6) For requirements relating to the control of hazardous energy (lockout-tagout) see WAC 296-307-320.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28006, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28014 What requirements apply to prime-mover guards?** "Flywheels" include flywheels, balance wheels, and flywheel pulleys mounted and revolving on crankshaft of engine or other shafting.

"Prime movers" include steam, gas, oil, and air engines, motors, steam and hydraulic turbines, and other equipment used as a source of power.

(1) Unless guarded by location, flywheels must be guarded according to the following requirements:

(a) Guard enclosures are made of sheet, perforated, or expanded metal, or woven wire.

(b) Guard rails are between 15 and 20 inches from the rim. When a flywheel extends into a pit or is within 12 inches of the floor, a standard toeboard is provided.

(c) When the upper rim of a flywheel extends through a working floor, it is surrounded by a guardrail and toeboard.

(d) Exception: When a flywheel with a smooth rim 5 feet or less in diameter cannot be guarded by the above methods, you must guard by meeting the following requirements:

On the exposed side, cover the flywheel spokes with a disk that makes a smooth surface and edge, and provides for inspection. You may leave an open space, less than 4 inches wide, between the outside edge of the disk and the rim of the wheel, to turn the wheel over. If you use a disk, keys or other projections left uncovered by the projections shall be cut off or covered.

Note: This exception does not apply to flywheels with solid web centers.

(e) At the flywheel of a gas or oil engine, you may provide an adjustable guard for starting the engine or for running adjustment. A slot opening for a jack bar is permitted.

(f) For flywheels above working areas, you must install guards that are strong enough to hold the weight of the flywheel if the shaft or wheel mounting fails.

(2) Cranks and connecting rods, when exposed to contact, must be guarded according to WAC 296-307-28046 and

296-307-28048, or by a guardrail according to WAC 296-307-28060.

(3) Tail rods or extension piston rods must be guarded according to WAC 296-307-28046 and 296-307-28048, or by a guardrail on the sides and end, with a clearance of between 15 and 20 inches when rod is fully extended.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28014, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28014, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28014, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28016 What requirements apply to guarding shafting?** Revolving shafts must be guarded by a standard safeguard unless guarded by location.

(1) All shafting must be secured against excessive end movement.

(2) Guarding horizontal shafting.

(a) Unless guarded by location, all exposed parts of horizontal shafting, must be enclosed in a guard that covers the shafting completely or by a trough that covers the sides and top or sides and bottom of the shafting as location requires.

(b) Shafting under bench machines must be enclosed by a guard that covers the shafting completely or by a trough that covers the sides and top or sides and bottom of the shafting as location requires. The sides of the trough must extend to at least 6 inches from the underside of table. If shafting is near the floor, the trough must extend to at least 6 inches from the floor. In every case, the sides of trough must extend at least 2 inches beyond the shafting or projection.

Exception: Maintenance runways are exempt from this requirement. "Maintenance runway" means any permanent runway or platform used for oiling, maintenance, running adjustment, or repair work, but not for passageway.

(3) Unless guarded by location, vertical and inclined shafting must be enclosed according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060.

Exception: Maintenance runways are exempt from this requirement.

(4) Projecting shaft ends.

(a) Projecting shaft ends must have a smooth edge and end and must not project more than one-half the diameter of the shaft unless guarded by nonrotating caps or safety sleeves.

(b) Unused keyways must be filled up or covered.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28016, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28016, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28016, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28018 What requirements apply to guarding pulleys?** (1) Unless guarded by location, pulleys must be guarded according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060. Pulleys serving as balance wheels (e.g., punch presses) on which the point of contact between belt and pulley is more than 6 feet 6 inches from the floor or platform may be guarded with a disk covering the spokes.

(2) If the distance to the nearest fixed pulley, clutch, or hanger is equal to or less than the width of the belt, then you

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must provide a guide to prevent the belt from leaving the pulley on the side where insufficient clearance exists.

(3) Where there are overhanging pulleys on line, jack, or countershafts with no bearing between the pulley and the outer end of the shaft, you should provide a guide to prevent the belt from running off the pulley.

(4) Pulleys with cracks, or pieces broken out of rims are prohibited.

(5) Pulleys must be designed and balanced for the operating speed.

(6) Composition or laminated wood pulleys must not be installed where they are likely to deteriorate.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28018, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28020 What requirements apply to guarding horizontal belt, rope, and chain drives?** "Belts" include all power transmission belts, such as flat belts, round belts, V-belts, etc., unless otherwise specified.

(1) Where both runs of horizontal belts are 7 feet or less from the floor level, the guard must extend to at least 15 inches above the belt or to a standard height. (See Table P-1.)

Exception: Where both runs of a horizontal belt are 42 inches or less from the floor, the belt must be fully enclosed according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060.

(2) In power development rooms, a guardrail may be used instead of the guard.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28020, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28020, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28020, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28022 What requirements apply to guarding overhead horizontal belt, rope, and chain drives?** (1) Unless guarded by location, overhead horizontal belts must be guarded on the sides and bottom according to WAC 296-307-28054.

(2) Unless guarded by location, horizontal overhead belts must be guarded for their entire length when:

(a) Located over passageways or work places and traveling 1,800 feet or more per minute.

(b) The center to center distance between pulleys is 10 feet or more.

(c) The belt is 8 inches wide or more.

(3) Where the upper and lower runs of horizontal belts are located so that employees can pass between them, the passage must be either:

(a) Completely barred according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060; or

(b) In a passage that employees must use, there must be a platform over the lower run guarded on either side by a railing that is completely filled in with wire mesh or other filler, or by a solid barrier. The upper run must be guarded to prevent contact by the employee or by objects carried by the employee.

(4) Overhead chain and link belt drives must be guarded according to the same requirements as overhead horizontal belts.

(5) American or continuous system rope drives located where the condition of the rope (particularly the splice) cannot be constantly and conveniently observed, must have an alarm (preferably electric-bell type) that will warn when the rope begins to fray.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28022, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28022, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28022, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28024 What requirements apply to guarding vertical and inclined belts?** (1) Vertical and inclined belts must be guarded according to WAC 296-307-28044 and 296-307-28050 through 296-307-28060.

(2) All guards for inclined belts must provide a minimum clearance of 7 feet between belt and floor at any point outside of the guard.

(3) A vertical or inclined belt may be guarded with a nip-point belt and pulley guard, if it is:

(a) 2-1/2 inches wide or less;

(b) Running at a speed of less than one thousand feet per minute; and

(c) Free from metal lacings or fastenings.

"Nip-point belt and pulley guard" means a device that encloses the pulley and has rounded or rolled edge slots through which the belt passes.

(4) Vertical belts running over a lower pulley more than seven feet above floor or platform must be guarded according to the same requirements as horizontal overhead belts, if the belt is:

(a) Located over passageways or work places and traveling 1,800 feet or more per minute;

(b) Eight inches wider or more.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28024, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28024, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28024, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28026 What requirements apply to guarding cone-pulley belts?** (1) The cone belt and pulley must have a belt shifter that adequately guards the nip point of the belt and pulley. If the frame of the belt shifter does not adequately guard the nip point of the belt and pulley, the nip point must be protected by a vertical guard in front of the pulley that extends at least to the top of the largest step of the cone.

"Belt shifter" means a device for mechanically shifting belts from tight to loose pulleys or vice versa, or for shifting belts on cones of speed pulleys.

(2) If the belt is endless or laced with rawhide laces, and no belt shifter is used, the belt may be guarded according to the following:

(a) The nip point of the belt and pulley is protected by a nip point guard in front of the cone;

(b) The guard extends at least to the top of the largest step of the cone; and

(c) The guard is formed to show the contour of the cone.

(3) If the cone is less than 3 feet from the floor or working platform, the cone pulley and belt must be guarded to a

height of 3 feet regardless of whether the belt is endless or laced with rawhide.

[97-09-013, recodified as § 296-307-28026, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28026, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28028 What requirements apply to guarding belt tighteners?** (1) Suspended counterbalanced belt tighteners and all components must be substantially constructed and securely fastened. The bearings must be securely capped. You must provide a mechanism to prevent the tightener from falling in case the belt breaks.

(2) Unless guarded by location, suspended counterweights must be encased to prevent accident.

(3) Belt tighteners used for starting and stopping machinery, unless held by gravity in the "off" or "out of service" position, must have a mechanism that will hold the belt tightener away from the belt when not in use. The mechanism must automatically grip, latch or otherwise fasten itself to and hold the belt tightener in "off" or "out of service" position until released by hand.

[97-09-013, recodified as § 296-307-28028, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28028, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28030 What requirements apply to guarding gears, sprockets, and chains?** (1) Gears must be guarded by one of the following methods:

(a) A complete enclosure; or

(b) A standard guard according to WAC 296-307-28050 through 296-307-28060, at least 7 feet high extending 6 inches above the mesh point of the gears; or

(c) A band guard covering the face of gear. The guard must have flanges extended inward beyond the root of the teeth on the exposed side or sides. If a part of the train of gears guarded by a band guard is less than 6 feet from the floor, the gear must be guarded by a disk guard or by a complete enclosure at least 6 feet tall.

(2) Hand-operated gears used only to adjust hand-powered machine parts may be unguarded. However, we recommend guarding these gears.

(3) Unless guarded by location, all sprocket wheels and chains must be enclosed. Where the drive extends over other machine or working areas, you must provide protection against falling parts.

Exception: This section does not apply to manually operated sprockets.

(4) When gears require frequent oiling, you must provide openings with hinged or sliding self-closing covers. All points not readily accessible must have oil feed tubes if lubricant is added while machinery is in motion.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28030, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28030, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28030, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28032 What requirements apply to guarding friction drives?** When exposed to contact, the driving point of all friction drives must be guarded. All arm or spoke friction drives and all web friction drives with holes

in the web must be entirely enclosed. When exposed to contact, all projecting belts on friction drives must be guarded.

[97-09-013, recodified as § 296-307-28032, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28032, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28034 What requirements apply to guarding keys, set screws, and other projections?** (1) All projecting keys, set screws, and other projections in revolving parts must be removed, or made flush, or guarded by metal covers.

(2) Projections, such as exposed bolts, keys, or set screws that are part of sprockets, grooved pulleys or pulleys on stationary equipment must be shielded unless guarded by location.

Exception: This section does not apply to keys or set screws within gear or sprocket casings or other enclosures, nor to keys, set screws, or oilcups in hubs of pulleys less than 20 inches in diameter where they are within the plane of the rim of the pulley.

Note: We recommend that you not use projecting set screws or oilcups in any revolving pulley or part of machinery.

[97-09-013, recodified as § 296-307-28034, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28034, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28036 What requirements apply to guarding collars and couplings?** (1) All revolving collars, including split collars, must be cylindrical. Screws or bolts used in collars must not project beyond the largest periphery of the collar.

(2) Shaft couplings must be constructed to prevent hazard from bolts, nuts, set screws, or revolving surfaces. Bolts, nuts, and set screws are permitted where they are covered with safety sleeves or where they are used parallel with the shafting and are countersunk or where they do not extend beyond the flange of the coupling.

[97-09-013, recodified as § 296-307-28036, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28036, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28038 Must self-lubricating bearings be used?** We recommend that you use self-lubricating bearings. All drip cups and pans must be securely fastened.

[97-09-013, recodified as § 296-307-28038, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28038, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28040 What requirements apply to guarding clutches, cutoff couplings, and clutch pulleys?**

(1) Unless guarded by location, clutches, cutoff couplings, or clutch pulleys with projecting parts must be enclosed by a stationary guard constructed according to WAC 296-307-28046. You may use a "U" type guard.

(2) In enginerooms, a guardrail, preferably with toe-board, may be used instead of the guard if the room is only occupied by engineroom attendants.

(3) A bearing support next to a friction clutch or cutoff coupling must have self-lubricating bearings that require infrequent maintenance.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-28040, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28040, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

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and [49.17.]060. 96-22-048, § 296-306A-28040, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28042 What requirements apply to guarding belt shifters, clutches, shippers, poles, perches, and fasteners?** "Belt pole" (sometimes called a "belt shipper" or "shipper pole") means a device used in shifting belts on and off fixed pulleys on line or countershaft where there are no loose pulleys.

(1) Tight and loose pulleys must have a permanent belt shifter with a mechanical means to prevent the belt from creeping from loose to tight pulley.

(2) Belt shifter and clutch handles must be rounded. They must be as far as possible from danger of accidental contact, but within easy reach of the operator. Where belt shifters are not directly over a machine or bench, the handles must be cut off 6 feet 6 inches above floor level.

(3) All belt and clutch shifters of the same type in each shop should move in the same direction to stop machines, i.e., either all right or all left.

Exception: This requirement does not apply to a friction clutch on a countershaft carrying two clutch pulleys with open and crossed belts. In this case the shifter handle has three positions and the machine is at a standstill when the clutch handle is in the neutral or center position.

(4) When belt poles must be used as a substitute for mechanical shifters, they must be big enough for employees to grasp them securely. Poles must be smooth and preferably of straight grain hardwood, such as ash or hickory. The edges of rectangular poles should be rounded. Poles should extend from the top of the pulley to within approximately 40 inches of the floor or working platform.

(5) Where loose pulleys or idlers are not practical, belt perches such as brackets, rollers, etc., must be used to keep idle belts away from the shafts. Perches should be substantial and designed for safe belt shifting.

(6) Belts that must be shifted by hand and belts within seven feet of the floor or working platform that are not guarded according to WAC 296-307-28046 must not be fastened with metal, nor with any other fastening that creates a hazard.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-28042, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28042, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28042, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28044 What materials must be used for standard guards?** (1) Standard guards must be made of the following materials:

- (a) Expanded metal;
- (b) Perforated or solid sheet metal;
- (c) Wire mesh on a frame of angle iron; or
- (d) Iron pipe securely fastened to the floor or the frame of the machine.

(2) Wire mesh should have wires that are securely fastened at every cross point either by welding, soldering, or galvanizing.

Exception: Diamond or square wire mesh made of No. 14 gauge wire, 3/4-inch mesh or heavier is exempt from this requirement.

[97-09-013, recodified as § 296-307-28044, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28044, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28046 How must standard guards be manufactured?** (1) Guards must be free from burrs, sharp edges, and sharp corners.

(2) Expanded metal, sheet or perforated metal, and wire mesh must be securely fastened to the frame by one of the following methods:

(a) Rivets or bolts spaced not more than five inches center to center. In case of expanded metal or wire mesh, metal strips or clips must be used to form a washer for rivets or bolts.

(b) Welding to frame every four inches.

(c) Weaving through channel or angle frame, or, if No. 14 gauge 3/4-inch mesh or heavier is used, by bending entirely around rod frames.

(d) To fill openings in pipe railing with expanded metal, wire mesh, or sheet metal, make the filler material into panels with rolled edges or edges bound with "V" or "U" edging. The edging must be of at least No. 24 gauge sheet metal fastened to the panels with bolts or rivets spaced a maximum of 5 inches center to center. The bound panels must be fastened to the railing by sheet-metal clips spaced a maximum of 5 inches center to center.

(e) Diamond or square mesh made of crimped wire fastened into channels, angle iron, or round-iron frames may also be used as a filler in guards. Size of mesh must correspond to Table P-1.

(3) Where guard design requires filler material greater than 12 square feet, additional frame members must be provided to ensure that the panel area is a maximum of 12 square feet.

(4) All joints of framework must be as strong as the material of the frame.

[97-09-013, recodified as § 296-307-28046, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28046, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28048 What requirements apply to disk, shield, and U-guards?** (1) A disk guard must have a sheet-metal disk of at least No. 22 gauge fastened by U-bolts or rivets to the spokes of pulleys, flywheels, or gears. To prevent contact with sharp edges of the disk, the edge must be rolled or wired. In all cases, the nuts must have locknuts on the unexposed side of the wheel.

(2) A shield guard must have a frame filled in with wire mesh or expanded, perforated, or solid sheet metal.

(3) If the shield area is less than six square feet, the wire mesh or expanded metal may be fastened in a framework of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle iron, or a metal construction of equivalent strength. Metal shields may have edges entirely rolled around a 3/8-inch solid iron rod.

(4) A U-guard consisting of a flat surface with edge members must cover the under surface and lower edge of a belt, multiple chain, or rope drive. It must be constructed of materials specified in Table P-1, and must meet the requirements of WAC 296-307-28054 through 296-307-28058. Edges must be smooth and, if the size of the guard requires,

be reinforced by rolling, wiring, or by binding with angle or flat iron.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-28048, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28048, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28048, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28050 What materials must be used for guards?** The materials and dimensions specified in this section apply to all guards. The materials and dimensions specified are minimum requirements. You may choose to provide stronger guards.

Exception: Horizontal overhead belts, rope, cable, or chain guards more than 7 feet above floor, or platform must meet the requirements outlined in Table P-2.

(1) The framework of all guards must have minimum dimensions of 1-inch by 1-inch by 1/8-inch for angle iron, 3/4-inch inside diameter for metal pipe, or metal construction of equivalent strength.

Exception: Guards thirty inches tall or less with a total surface area of ten square feet or less may have a framework of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle iron, or metal construction of equivalent strength. The filling material must correspond to the requirements of Table 1.

(a) All guards must be rigidly braced every 3 feet of their height to some fixed part of machinery or building structure. Where a guard is exposed to contact with moving equipment additional strength may be necessary.

(b) The framework for all guards fastened to the floor or working platform and without other support or bracing must consist of 1-1/2-inch by 1-1/2-inch by 1/8-inch angle iron, metal pipe of 1-1/2-inch inside diameter, or metal construction of equivalent strength. All rectangular guards must have at least four upright frame members that extend to the floor and are securely fastened. Cylindrical guards must have at least three supporting members that extend to the floor.

(2) Where guards are exposed to unusual wear, deterioration, or impact, heavier material and construction should be used to protect against the specific hazards involved.

[97-09-013, recodified as § 296-307-28050, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28050, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28052 When may wood guards be used?** Wood guards may be used where fumes would cause rapid deterioration of metal guards and outdoors where extreme cold or extreme heat make metal guards and railings undesirable.

(1) Wood must be sound, tough, and without loose knots.

(2) Guards must be made of planed lumber not less than 1-inch rough board measure, with rounded edges and corners.

(3) Wood guards must be securely fastened together with wood screws, hardwood dowel pins, bolts, or rivets.

(4) Wood guards must be equal in strength and rigidity to metal guards specified in WAC 296-307-28050 and Table P-1.

Note: Requirements for the construction of standard wood railings are in WAC 296-307-28060.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28052, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28052, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28052, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28054 What materials may be used for guarding horizontal overhead belts?** (1) Guards for horizontal overhead belts must run the entire length of the belt and follow the line of the pulley to the ceiling or extend to the nearest wall.

Exception: Where belts are located so that it is impractical to extend the guard to wall or ceiling, the guard must completely enclose the top and bottom runs of the belt and the face of pulleys.

(2) The guard and its supporting parts must be securely fastened to the wall or ceiling by gimlet-point lag screws or through bolts. In masonry, expansion bolts must be used. We recommend using bolts placed horizontally through floor beams or ceiling rafters.

(3) When necessary, suitable reinforcement must be provided for the ceiling rafters or overhead floor beams to sustain safely the weight and stress imposed by the guard.

(4) The interior surface of all guards must be smooth and free from projections.

Exception: Where construction demands it, protruding shallow round-head rivets may be used.

[97-09-013, recodified as § 296-307-28054, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28054, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28056 What clearance must be maintained between guards and power transmission machinery?** (1) Overhead belt guards must be at least one-quarter wider than the belt they protect, with a maximum clearance of 6 inches on each side. Overhead rope-drive and block and roller-chain-drive guards must be at least six inches wider than the drive on each side.

(2) Overhead silent chain-drive guards with the chain held on sprockets must have side clearance of:

(a) On drives of 20-inch centers or less, at least 1/4 inch from the nearest moving chain part, and

(b) On drives of over 20-inch centers, a minimum of 1/2 inch from the nearest moving chain part.

(3) Table 2 gives the sizes of materials and construction specifications for guards for belts that are 10 inches wide or more. All materials for overhead belt guards must be at least the size specified in Table 2 for belts 10 to 14 inches wide, even if the overhead belt is less than 10 inches wide. However, No. 20 gauge sheet metal may be used as a filler on guards for belts less than 10 inches wide. Expanded metal, because of the sharp edges, should not be used as a filler in horizontal belt guards.

(4) For clearance between guards and belts, ropes, or chains see Table P-2.

[97-09-013, recodified as § 296-307-28056, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28056, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28058 How must overhead rope and chain-drive guards be constructed?** (1) Overhead-rope and chain-drive guard construction must meet the requirements for overhead-belt guard construction of similar width.

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Exception: The filler material must be solid, according to Table P-2, unless fire hazard demands the use of open construction.

(2) A side guard member of the same solid filling material should extend 2 inches above the level of the lower run of the rope or chain drive and 2 inches within the periphery of the pulleys that the guard encloses, forming a trough.

(3) The side filler members should be reinforced on the edges with 1-1/2-inch by 1/4-inch flat steel, riveted to the filling material at 8 inch centers or less. The reinforcing strip should be fastened or bolted to all guard supporting members with at least one 3/8-inch rivet or bolt at each intersection, and the ends should be secured to the ceiling with lag screws or bolts.

(4) The filling material must be fastened to the framework of the guard and the filler supports by 3/16-inch rivets spaced on 4-inch centers. Measure the width of a multiple drive from the outside of the first to the outside of the last rope or chain in the group accommodated by the pulley.

[97-09-013, recodified as § 296-307-28058, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28058, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28060 What materials must be used for guardrails and toeboards?** (1) A guardrail used to guard power transmission parts must be 42 inches tall, with a mid-rail between the top rail and the floor.

(2) Posts must be 8 feet apart or less. They must be permanent and substantial, smooth, and free from protruding nails, bolts, and splinters. If made of pipe, the post must be at least 1-1/4 inches inside diameter. If posts are made of metal shapes or bars, the section must be as strong as posts made of 1-1/2 by 1-1/2 by 3/16-inch angle iron. If posts are made of wood, the posts must be at least 2 by 4 inches. The upper rail must be 2 by 4 inches, or two 1 by 4 inch strips, one at the top and one at the side of the posts. The midrail must be at least 1 by 4 inches.

(3) The rails (metal shapes, metal bars, or wood), should be on the side of the posts that gives the best protection and support. Where panels are fitted with expanded metal or wire mesh (as noted in Table 1) the middle rails may be omitted. Where guard is exposed to contact with moving equipment, additional strength may be necessary.

(4) Toeboards must be at least 4 inches tall, of wood, metal, or metal grill of a maximum 1-inch mesh. Toeboards at flywheel pits should be placed as close to edge of the pit as possible.

Table P-1  
TABLE OF STANDARD MATERIALS AND DIMENSIONS

Material	Clearance from moving part at all points (inches)	Largest mesh or opening allowable (inches)	Minimum gauge (U.S. Standard) or thickness (inches)	Minimum height of guard from floor or platform level (feet)
<i>Woven wire</i>	Under 2	3/8	No. 16	7
	2-4	1/2	No. 16	7
	Under 4	1/2	No. 16	7
	4-15	2	No. 12	7
<i>Expanded metal</i>	Under 4	1/2	No. 18	7
	4-15	2	No. 13	7
<i>Perforated metal</i>	Under 4	1/2	No. 20	7
	4-15	2	No. 14	7
<i>Sheet metal</i>	Under 4		No. 22	7
	4-15		No. 22	7
<i>Wood or metal strip crossed</i>	Under 4	3/8	Wood 3/4 Metal No. 16	7
	4-15	2	Wood 3/4 Metal No. 16	7
<i>Wood or metal strip not crossed</i>	Under 4	1/2 width	Wood 3/4 Metal No. 16	7
	4-15	1 width	Wood 3/4 Metal No. 16	7
<i>Standard rail</i>	Min. 15			
	Max. 20			

Table P-2  
HORIZONTAL OVERHEAD BELTS, ROPES, AND CHAINS  
7 FEET OR MORE ABOVE FLOOR OR PLATFORM

	Width 0"-14" inclusive	Material
<b>MEMBERS</b>		
Framework	1 1/2" x 1 1/2" x 1/4"	Angle iron
Filler (belt guards)	1 1/2" x 3/16"	Flat iron
Filler and vertical side member	No. 20 A.W.G.	Solid sheet metal
Filler supports	2" x 5/16" flat iron	Flat and angle
Guard supports	2" x 5/16"	Flat iron
<b>FASTENINGS</b>		
Filler supports to framework	(2) 3/16"	Rivets
Filler flats to supports (belt guards)	(1) 5/16"	Flush rivets
Filler to frame and supports (chain guards)	3/16"	Rivets spaced
Guard supports to framework	(2) 3/6"	Rivets or bolts
Guard and supports to overheard ceiling	1/4" x 3 1/2" lag screws or 1/2" bolts	Lag screws or bolts
<b>DETAILS-SPACING, ETC.</b>		
Width of guards	One-quarter wider than belt, rope, or chain drive	
Spacing between filler supports	20" center to center	
Spacing between filler flats (belt guards)	2" apart	
Spacing between guard supports	36" center to center	
<b>OTHER BELT GUARD FILLING PERMITTED</b>		
Sheet metal fastened as in chain guards	No. 20 A.W.G.	Solid or perforated
Woven Wire, 2" mesh	No. 12 A.W.G.	
<b>CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD</b>		
Distance center to center of shafts	Up to 15' inclusive	Over 40'
Clearance from belt, or chain to guard	16"	120"
	Width over 14" to 24" inclusive	Material
<b>MEMBERS</b>		
Framework	2" x 2" x 5/16"	Angle iron
Filler (belt guards)	2" x 3/16"	Flat iron
Filler and vertical side member	No. 18 A.W.G.	Solid sheet metal

Filler supports	2" x 3/8" flat iron	Flat and angle
Guard supports	2" x 3/8"	Flat iron
FASTENINGS		
Filler supports to framework	(2) 3/6"	Rivets
Filler flats to supports (belt guards)	(1) 5/16"	Flush rivets
Filler to frame and supports (chain guards)	8" centers on sides and 4" centers on bottom	
Guard supports to framework	(2) 7/16"	Rivets or bolts
Guard and supports to overhead ceiling	5/8" x 4" lag screws or 5/8" bolts	Lag screws or bolts
DETAILS-SPACING, ETC.		
Width of guards		
Spacing between filler supports	16" C. to C	
Spacing between filler flats (belt guards)	2 1/2" apart	
Spacing between guard supports	36" C. to C	
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 18 A.W.G.	Solid or perforated
Woven wire, 2" mesh	No. 10 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Over 15' to 25'	Over 40' inclusive
Clearance from belt/chain to guard	10"	20"
	Width over 24"	Material
MEMBERS		
Framework	3" x 3" x 3/8"	Angle iron
Filler (belt guards)	2" x 5/16"	Flat iron
Filler and vertical side member	No. A.W.G.	Solid sheet metal
Filler supports	2 1/2" x 2 1/2" x 1/4" angle	Flat and angle
Guard supports	2 1/2" x 3/8"	Flat iron
FASTENINGS		
Filler supports to framework	(3) 1/2"	Rivets
Filler flats to supports (belt guards)	(2) 3/8"	Flush rivets
Filler to frame and supports (chain guards)		
Guard supports to frame work	(2) 5/8"	Rivets or bolts
Guard and supports to overhead ceiling	3/4" x 6" lag screws or 3/4" bolt	Lag screws or bolts
DETAILS-SPACING, ETC.		
Width of guards		
Spacing between filler supports		16" C. to C.
Spacing between filler flats (belt guards)		4" apart
Spacing between guard supports		36" C. to C.
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 18 A.W.G.	Solid or perforated
Woven wire, 2" mesh	No. 8 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Over 25' to 40' inclusive	Over 40'
Clearance from belt, or chain to guard	15"	20"

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28060, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-28060, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28060, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28062 How must shafting be maintained?** (1) Shafting must be kept in alignment, and free from rust and excess oil or grease.

(2) Where explosives, explosive dusts, flammable vapors or flammable liquids exist, guards must take into account the hazard of static sparks from shafting.

[97-09-013, recodified as § 296-307-28062, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28062, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28064 How must pulleys be maintained?** (1) Pulleys must be kept in proper alignment to prevent belts from running off. They will run off a pulley when

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(2) Any pulley carrying a nonshifting belt should have a crowned face.

(3) Cast-iron pulleys should be tested frequently with a hammer to detect cracks in rim or spokes. The sound is different depending on whether the belt is or is not on the pulley.

(4) Split pulleys should be inspected to be sure that all bolts holding together the sections of the pulley are tight.

[97-09-013, recodified as § 296-307-28064, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28064, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28066 How must belts be maintained?** (1) Quarter-twist belts without an idler can be used on drives direction is reversed.

(2) You must inspect belts, lacings, and fasteners to be sure they are kept in good repair.

(3) Dressing should not be applied when the belt or rope is in motion; but, when necessary, it should be applied where belts or rope leave the pulley, not where they approach. The same precautions apply to lubricating chains. In the case of V-belts, belt dressing is neither necessary nor advisable.

[97-09-013, recodified as § 296-307-28066, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28066, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-28068 How must other equipment be maintained?** (1) You must inspect all power-transmission equipment at least every 60 days and ensure that it is kept in good working condition at all times.

(2) Bearings must be kept in alignment and properly adjusted.

(3) Hangers must be inspected to ensure that all supporting bolts and screws are tight and that supports of hanger boxes are adjusted properly.

(4) The oilers must wear tightfitting clothing and should use cans with long spouts to keep their hands out of danger. Machinery must be oiled when not in motion, wherever possible.

[97-09-013, recodified as § 296-307-28068, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28068, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-290 Auger conveying equipment.**

[97-09-013, recodified as § 296-307-290, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-290, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-29005 What requirements apply to auger conveying equipment?** "Augers" means screw conveyors and related accessories designed primarily for conveying agricultural materials on farms.

(1) Power take-off shafts must be guarded according to WAC 296-307-28046.

(2) All augers must be covered or guarded when exposed to contact.

(3) You must ensure that each sweep auger has its top half shielded by a guard. All guard openings must be no larger than 4 3/4 inches across.

(4) You must ensure that the exposed auger at the hopper and the intake is guarded or designed to prevent accidental contact with the rotating inlet area. The guard must extend at least 2 1/2 inches above and below the exposed auger. Openings in the guard, for the free flow of material, must be no larger than 4 3/4 inches across and must be strong enough to support 250 pounds at mid span.

(5) The hand raising winch must have a control that will hold the auger at any angle, and that will only respond to the control. You must ensure that the operator is able to lower the auger without disengaging the control. The maximum force required on the handle to raise or lower the auger manually must be 50 pounds.

(6) The wire rope lifting pulleys must be grooved to fit the wire rope used.

(7) In order to avoid separation, you must provide a positive restraint between the auger tube and the under-carriage

lifting arm. You must provide stops that restrict the maximum raised angle and minimum lowered angle.

(8) Wire ropes (cables) must be rust resistant and selected for the design load and service intended.

(9) You must provide the auger operator with service and operation instructions that include safe operation and servicing practices.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-29005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-29005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-29005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-29010 What other requirements apply to auger conveying equipment manufactured after October 25, 1976?** You must ensure that auger conveying equipment manufactured after October 25, 1976, is guarded as follows:

(1) Sweep-arm material-gathering mechanisms used on the top surface of materials within silo structures are guarded. The lower or leading edge of the guard is no more than 12 inches above the material surface and no less than 6 inches in front of the leading edge of the rotating member of the gathering mechanism. The guard is parallel to and extends the fullest practical length of the material gathering mechanism.

(2) Exposed auger flighting on portable grain augers is guarded with either grating type guards or solid baffle style covers as follows:

(a) The largest dimensions or openings in grating type guards through which materials flow is 4-3/4 inches. The opening area is a maximum of 10 square inches. The opening is least 2-1/2 inches from the rotating flighting.

(b) Slotted openings in solid baffle style covers are a maximum of 1-1/2 inches wide, or less than 3-1/2 inches from the exposed flighting.

[97-09-013, recodified as § 296-307-29010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-29010, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-300 Guarding farmstead equipment.**

[97-09-013, recodified as § 296-307-300, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-300, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-30003 What does this section cover?** WAC 296-307-300 applies to the guarding and care of farmstead equipment.

"Farmstead equipment" means agricultural equipment normally used in a stationary manner. This includes, but is not limited to, materials handling equipment and accessories for such equipment whether or not the equipment is an integral part of a building.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-30003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-30003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-30006 How must power takeoff shafts of farmstead equipment be guarded?** (1) You must ensure that all power takeoff shafts, including rear-mounted, mid-mounted or side-mounted shafts, are guarded either by a mas-

ter shield or by other protective guarding. The master shield must be strong enough to prevent damaging the shield when a 250-pound operator mounts or dismounts the tractor using the shield as a step.

(2) Power takeoff driven equipment must be guarded to prevent employee contact with rotating parts of the power drive system. Where power takeoff driven equipment requires removal of the tractor master shield, the equipment must also include protection from any portion of the tractor power takeoff shaft that protrudes from the tractor.

(3) Signs must be placed at prominent locations on power takeoff driven equipment specifying that power drive system safety shields must be kept in place.

[97-09-013, recodified as § 296-307-30006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-30009 How must other power transmission components of farmstead equipment be guarded?**

(1) All power transmission parts must be guarded according to WAC 296-307-280.

(2) Smooth shafts and shaft ends (without any projecting bolts, keys, or set screws) may be unguarded if they:

- (a) Revolve at less than 10 RPM; and
- (b) Are part of feed handling equipment used on the top surface of materials in bulk storage facilities.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-30009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-30009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-30012 How must functional components of farmstead equipment be guarded?**

The following functional components must be shielded to a degree consistent with the intended function and operator's vision of the component:

- Snapping or husking rolls;
- Straw spreaders and choppers;
- Cutterbars;
- Flail rotors;
- Rotary beaters;
- Mixing augers;
- Feed rolls;
- Rotary tillers; and
- Similar units that must be exposed for proper function.

[97-09-013, recodified as § 296-307-30012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-30015 When may guards be removed on farmstead equipment?**

(1) Guards, shields and access doors must be in place when the equipment is in operation.

(2) Where removal of a guard or access door will expose an employee to any component that continues to rotate after the power is disengaged, you must provide in the immediate area, a safety sign warning the employee:

- (a) To look and listen for evidence of rotation; and
- (b) To refrain from removing the guard or access door until all components have stopped.

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(3) On equipment manufactured after October 25, 1976, a readily visible or audible warning of rotation is required.

[97-09-013, recodified as § 296-307-30015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-30018 What requirements apply to electrical control for maintaining and servicing farmstead equipment?**

(1) You must ensure that only the employee maintaining or servicing equipment has control of the electrical power source by:

(a) Providing an exclusive, positive locking means on the main switch that can be operated only by the employee performing the maintenance or service; or

(b) For material handling equipment in a bulk storage structure, by providing on the equipment an electrical or mechanical means to disconnect the power. Minimum lock-out means must meet the requirements of WAC 296-307-320.

(2) All circuit protection devices, including those that are an integral part of a motor, must have a manual reset, except where:

(a) A manual reset is infeasible because of the nature of the operation, distances involved, and the amount of time normally spent by employees in the area of the affected equipment;

(b) An electrical disconnect switch is available to the employee within fifteen feet of the equipment being maintained or serviced; and

(c) A sign, prominently posted near each hazardous component, warns the employee that unless the electrical disconnect switch is utilized, the motor could automatically reset while the employee is working on the hazardous component.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-30018, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-30018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-30021 What additional guarding requirements apply to farmstead equipment?**

(1) You must ensure that carton or bag stitching machines are properly safeguarded to prevent anyone from coming in contact with the stitching head and other pinch or nip points.

(2) The point of operation of all machines must be guarded. The guard must be designed and constructed to prevent the operator from having any part of the body in the danger zone during the operating cycle.

Note: The distance from the point-of-operation guards to the danger line depends on the size of the opening. The required distances are outlined in the table below:

Guarding line or distance of opening from point of operation hazard (inches)	Maximum width of opening (inches)
1/2 to 1 1/2	1/4
1 1/2 to 2 1/2	3/8
2 1/2 to 3 1/2	1/2
3 1/2 to 5 1/2	5/8
5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 12 1/2	1 1/4

Guarding line or distance of opening from point of operation hazard (inches)	Maximum width of opening (inches)
12 1/2 to 15 1/2	1 1/2
15 1/2 to 17 1/2	1 7/8
17 1/2 to 31 1/2	2 1/8

[97-09-013, recodified as § 296-307-30021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30021, filed 10/31/96, effective 12/1/96.]

### Part Q Control of Hazardous Energy (Lockout-tagout)

#### WAC 296-307-320 Control of hazardous energy (lockout-tagout).

[97-09-013, recodified as § 296-307-320, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-320, filed 10/31/96, effective 12/1/96.]

#### WAC 296-307-32001 What does this section cover?

(1) WAC 296-307-320 covers the servicing and maintenance of machines and equipment in which the unexpected start up of the machine or equipment or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

(2) Normal production operations are not covered by this standard. Servicing and/or maintenance that takes place during normal production operations is covered by this standard only if:

- (a) An employee is required to remove or bypass a guard or other safety device; or
- (b) An employee is required to place a body part into a point of operation or where an associated danger zone exists during a machine operating cycle.

Exception: Minor servicing activities, that take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures that provide effective protection.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-32001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-08-051A, § 296-306A-32001, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-32001, filed 10/31/96, effective 12/1/96.]

#### WAC 296-307-32003 When does this section not apply? (1) WAC 296-307-320 does not apply to work on cord and plug connected electric equipment when:

(a) Unexpected energization or start up of the equipment is controlled by unplugging the equipment from the energy source; and

(b) The plug is under the exclusive control of the employee performing the servicing or maintenance.

(2) WAC 296-307-320 does not apply to hot tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, when:

- (a) Continuity of service is essential;
- (b) Shutdown of the system is impractical; and

(c) Documented procedures are followed, and special equipment is used that will provide proven effective protection for employees.

(3) WAC 296-307-320 does not cover exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations. These hazards are covered in chapter 296-307 WAC Part T.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-32003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32005 What definitions apply to this section?** "Affected employee" means an employee who uses a machine or equipment while it is serviced or maintained under lockout or tagout, or who works where such servicing or maintenance is being performed.

"Authorized employee" means a person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this part.

"Capable of being locked out" means an energy isolating device that has a hasp or other means for a lock to be affixed, or has a locking mechanism built into it. It also means that the device can be locked out without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability.

"Energized" means connected to an energy source or containing residual or stored energy.

"Energy isolating device" means a mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

- A manually operated electrical circuit breaker;
- A disconnect switch;
- A manually operated switch with conductors of circuit that can be disconnected from all ungrounded supply conductors and allows no pole to operate independently;
- A line valve;
- A block; and
- Any similar device used to block or isolate energy.

Push buttons, selector switches, and other control circuit devices are not energy isolating devices.

"Energy source" means any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy, including gravity.

"Hot tap" means a procedure used in repair, maintenance, and service activities that involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or accessories. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

"Lockout" means placing a lockout device on an energy isolating device, in accordance with an established procedure, to ensure that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

"Lockout device" means a device with a positive means such as a lock (key or combination type) to hold an energy isolating device in the safe position and prevents the energizing of a machine or equipment. Blank flanges and bolted slip blinds are included.

"Normal production operations" means using a machine or equipment for its intended production function.

"Servicing and/or maintenance" means workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning, or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or start up of the equipment or release of hazardous energy.

"Setting up" means any work performed to prepare a machine or equipment to perform its normal production operation.

"Tagout" means placing a tagout device on an energy isolating device, according to an established procedure, to indicate that the energy isolating device and the equipment being controlled must not be operated until the tagout device is removed.

"Tagout device" means a prominent warning device, such as a tag and attachment, that can be securely fastened to an energy isolating device according to an established procedure, to indicate that the energy isolating device and the equipment being controlled must not be operated until the tagout device is removed.

[97-09-013, recodified as § 296-307-32005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32007 What are the required elements of an energy control program?** You must establish a written energy control program consisting of:

- An energy control procedure;
- Employee training; and
- Periodic inspections.

The purpose of the program is to ensure that before any employee services or maintains a machine or equipment where the unexpected energizing, start up, or release of stored energy could occur and cause injury, the machine or equipment is isolated from the energy source, and rendered inoperative.

[97-09-013, recodified as § 296-307-32007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32009 How does an employer determine when to use lockout vs. tagout?** (1) If an energy isolating device is not capable of being locked out, your energy control program must use a tagout system.

(2) If an energy isolating device is capable of being locked out, your energy control program must use lockout unless a tagout system will provide full employee protection according to WAC 296-307-32011.

(3) Whenever major replacement or major repair, renovation, or modification of a machine or equipment is performed, and whenever new machines or equipment are

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installed, energy isolating devices for such machines or equipment must be designed to accept a lockout device.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-32009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32011 What requirements must be met to substitute tagout for lockout?** (1) You must ensure that when a tagout device is used on an energy isolating device that is capable of being locked out, the tagout device is attached at the same location that the lockout device would have been attached. You must also ensure that the tagout program will provide safety that is equivalent to a lockout program.

(2) To demonstrate that a tagout program provides safety that is equivalent to a lockout program, you must demonstrate full compliance with all tagout requirements and any other measures necessary to provide equivalent safety. Other measures include:

- (a) Implementing additional safety measures such as the removal of an isolating circuit element;
- (b) Blocking a controlling switch;
- (c) Opening an extra disconnecting device; or
- (d) Removing a valve handle to reduce the likelihood of inadvertent energization.

[97-09-013, recodified as § 296-307-32011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32013 What are the required elements of energy control procedures?** (1) You must develop, document, and use procedures to control potentially hazardous energy when employees are engaged in activities covered by this section.

Exception: You are exempt from documenting procedures for a particular machine or equipment only when all of the following elements exist:

- (a) The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down that could endanger employees;
- (b) The machine or equipment has a single energy source that can be readily identified and isolated;
- (c) The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;
- (d) The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
- (e) A single lockout device will achieve lockout;
- (f) The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
- (g) The servicing or maintenance does not create hazards for other employees; and
- (h) The worksite has experienced no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

(2) The procedures must clearly and specifically outline the scope, purpose, authorization, rules, and techniques for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

- (a) A specific statement of the intended use of the procedure;
- (b) Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy;

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(c) Specific procedural steps for the placement, removal, and transfer of lockout devices or tagout devices and the responsibility for them; and

(d) Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

[97-09-013, recodified as § 296-307-32013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32015 What requirements apply to lockout and tagout devices and materials?** (1) You must provide locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware for isolating, securing, or blocking machines or equipment from energy sources.

(2) Lockout and tagout devices must be singularly identified; must be the only device(s) used for controlling energy; must not be used for other purposes.

(3) Lockout and tagout devices must be durable and meet the following requirements:

(a) Lockout and tagout devices must be able to withstand the environment to which they are exposed for the maximum period of time that exposure is expected.

(b) Tagout devices must be constructed and printed so that exposure to weather conditions or wet and damp locations will not deteriorate the tag or make the tag's message illegible.

(c) Tags must not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

(4) Lockout and tagout devices must be the same within the facility in at least color, shape, or size. Also, tagout devices must have the same print and format.

(5) Lockout and tagout devices must be substantial and meet the following requirements:

(a) Lockout devices must be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

(b) Tagout devices and their means of attachment must be substantial enough to prevent accidental removal. Tagout device attachment means must be single-use, attachable by hand, self-locking, releasable with an unlocking strength of at least 50 pounds, and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

(c) Lockout and tagout devices must indicate the name of employee applying the device(s).

(6) Tagout devices must warn against hazardous conditions if the machine or equipment is energized and must include a message such as: "Do not start," "do not open," "do not close," "do not energize," "do not operate."

[97-09-013, recodified as § 296-307-32015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32017 How often must the energy control procedure be inspected?** (1) You must conduct an inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are followed.

(a) An authorized employee, other than the one(s) using the energy control procedure, must perform the inspection.

(b) The inspection must be conducted to correct any deviations or inadequacies identified.

(c) Where lockout is used for energy control, the inspection must include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure.

(d) Where tagout is used for energy control, the inspection must include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure, and the elements of WAC 296-307-32021.

(2) You must certify that the inspections have been performed. The certification must identify the machine or equipment on which the energy control procedure was being used, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32017, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-32017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32019 What general requirements apply to energy control program training and communication?** You must provide training to ensure that employees understand the purpose and function of the energy control program, and that employees have the knowledge and skills required for the safe application, use, and removal of the energy controls. The training must include the following:

(1) Each authorized employee must receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

(2) Each affected employee must be instructed in the purpose and use of the energy control procedure.

(3) All other employees who work in an area where energy control procedures must be used, must be instructed about the procedure and the prohibition against attempting to restart or reenergize machines or equipment that are locked out or tagged out.

[97-09-013, recodified as § 296-307-32019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32019, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32021 What additional requirements apply to tagout training and communication?** When tagout systems are used, employees must also be trained in the following limitations of tags:

(1) Tags are warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

(2) When a tag is attached to an energy isolating means, it is not to be removed without approval of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

(3) Tags must be legible and understandable by all authorized, affected, and other employees working in the area.

(4) Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace.

(5) Tags may create a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(6) Tags must be securely attached to energy isolating devices so that they cannot be accidentally detached during use.

[97-09-013, recodified as § 296-307-32021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32023 What requirements apply to employee retraining?** (1) Authorized and affected employees must be retrained whenever there is a change in job assignments, machines, equipment, or processes that present a new hazard, or when there is a change in the energy control procedures.

(2) Additional retraining must also be provided whenever an inspection reveals, or whenever you believe, that the employee's knowledge or use of the energy control procedures is inadequate.

(3) Retraining must reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

[97-09-013, recodified as § 296-307-32023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32023, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32025 What training records must an employer keep?** You must keep records that certify that employee training has been completed and is up to date. The records must contain each employee's name and dates of training.

[97-09-013, recodified as § 296-307-32025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32025, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32027 Who may perform lockout or tagout?** Lockout or tagout must be performed only by authorized employees performing the service or maintenance.

[97-09-013, recodified as § 296-307-32027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32029 Who must be notified of lockout and tagout?** Affected employees must be notified of the application and removal of lockout or tagout devices. Notification must be given before controls are applied and after they are removed.

[97-09-013, recodified as § 296-307-32029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32029, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32031 What order of events must lockout or tagout procedures follow?** The established lockout or tagout procedures must cover the following elements in the following sequence:

Machinery or equipment shutdown before lockout or tagout:

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(1) Before an authorized or affected employee turns off a machine or equipment, the authorized employee must have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

(2) The machine or equipment must be turned off or shut down using the procedures established for the machine or equipment. The shutdown must be done in the prescribed order to avoid increased hazards to employees.

(3) All necessary energy isolating devices must be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Application of the lockout or tagout device:

(4) Lockout or tagout devices must be affixed to each energy isolating device by authorized employees.

(5) Lockout devices, where used, must be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position.

(6) Tagout devices, where used, must be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

(a) Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment must be fastened at the same point at which the lock would have been attached.

(b) Where a tag cannot be affixed directly to the energy isolating device, the tag must be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

Eliminating the hazards of stored energy:

(7) After applying lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe.

(8) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation must be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

Before beginning service or maintenance:

(9) Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee must verify that the machine or equipment has been isolated and deenergized.

[97-09-013, recodified as § 296-307-32031, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32031, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32033 What order of events must be followed to remove lockout or tagout devices?** (1) Before removing lockout or tagout devices, the authorized employee must complete the following procedures:

(a) Inspect the work area to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

(b) Check the work area to ensure that all employees have been safely positioned or removed.

(2) After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees must be notified that the lockout or tagout device(s) have been removed.

(3) Each lockout or tagout device must be removed from each energy isolating device by the authorized employee who applied the device.

Exception: When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under your direction, if specific procedures and training for such removal have been developed, documented, and incorporated into the energy control program.

You must ensure that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure must include at least the following elements:

(a) Verification by the employer that the authorized employee who applied the device is not at the facility;

(b) Making all reasonable efforts to inform the authorized employee that the lockout or tagout device has been removed; and

(c) Ensuring that the authorized employee has this knowledge before resuming work at that facility.

[97-09-013, recodified as § 296-307-32033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32035 What requirements apply to testing and positioning machines and equipment?** When lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine or equipment, the following sequence of actions must be followed:

(1) Clear the machine or equipment of tools and materials according to WAC 296-307-32033 (1)(a).

(2) Remove employees from the machine or equipment area according to WAC 296-307-32033 (1)(b).

(3) Remove the lockout or tagout devices as specified in WAC 296-307-32033(3).

(4) Energize and proceed with testing or positioning.

(5) Deenergize all systems and reapply energy control measures in accordance with WAC 296-307-32031 to continue the servicing and/or maintenance.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32035, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-32035, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32035, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32037 What requirements apply to outside servicing contractors?** (1) Whenever outside servicing contractors are to be engaged in activities covered by this standard, you and the outside employer must inform each other of your respective lockout or tagout procedures.

(2) The outside employer must ensure that employees understand and comply with the restrictions and prohibitions of your energy control program.

[97-09-013, recodified as § 296-307-32037, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32037, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32039 What requirements apply to group lockout or tagout?** (1) When servicing and/or maintenance is performed by a crew or other group, they must use a procedure that provides a level of protection equivalent to

that provided by the implementation of a personal lockout or tagout device.

(2) Group lockout or tagout devices must be used according to the procedures required by WAC 296-307-32013 including, but not limited to, the following:

(a) An authorized employee has primary responsibility for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock); and

(b) A method for the authorized employee to determine if individual group members are exposed to release of stored energy hazards; and

(c) When more than one crew or group is involved, assignment of overall lockout or tagout control responsibility to an authorized employee designated to coordinate individual group members and ensure continuity of protection; and

(d) Each authorized employee must affix a personal lockout or tagout device to the group lockout device when beginning work, and must remove those devices when the work is complete.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32039, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-32039, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32039, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-32041 What requirements apply to lockout/tagout during shift changes?** During shift or personnel changes, you must ensure that employees follow specific procedures to ensure the continuity of lockout or tagout protection. The procedures must include orderly transfer of lockout or tagout protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start up of the machine or equipment, or release of stored energy.

[97-09-013, recodified as § 296-307-32041, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32041, filed 10/31/96, effective 12/1/96.]

## Part R

### Safety Color Coding; Accident Prevention Signs and Tags

**WAC 296-307-330 Safety color coding; accident prevention signs and tags.**

[97-09-013, recodified as § 296-307-330, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-330, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-33001 What definitions apply to this section?** "Accident prevention sign" ("sign") means a surface with text or pictographs, meant to warn or instruct employees who may be exposed to hazards. Safety posters and education bulletins are not included in this definition.

"Accident prevention tag" ("tag") means a card that identifies a hazardous condition, generally related to unsafe equipment.

"Major message" means the sign's or tag's text that is more specific than the signal word and that identifies the specific hazardous condition or safety instruction. Examples include: "High Voltage," "Close Clearance," "Do Not Start," or "Do Not Use" or a corresponding pictograph.

"Pictograph" means a pictorial representation that identifies a specific hazardous condition or safety instruction.

"Signal word" means the sign's or tag's text that contains the word, usually "danger" or "caution" that is intended to capture the employee's immediate attention.

[97-09-013, recodified as § 296-307-33001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-33003 What does red identify in safety color coding?** Use red to identify:

- (1) Fire protection equipment;
- (2) Safety cans or other portable containers of flammable liquids;
- (3) Danger signs and tags;
- (4) Emergency stop bars on hazardous machines; and
- (5) Stop buttons or electrical switches used to stop machinery in an emergency;

Red lights must be provided at barricades and at temporary obstructions, as specified in ANSI Safety Code for Building Construction, A10.2-1944.

[97-09-013, recodified as § 296-307-33003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-33005 What does yellow identify in safety color coding?** Use yellow to identify:

- (1) Caution signs and tags; and
- (2) Physical hazards.

[97-09-013, recodified as § 296-307-33005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-33007 When should signs and tags use "danger" versus "caution"?** (1) Danger signs and tags.

(a) Use danger signs and tags when an immediate hazard presents a threat of death or serious injury to employees.

(b) Instruct all employees that danger signs and tags indicate immediate danger and that special precautions are necessary.

(2) Caution signs and tags.

(a) Use caution signs and tags to warn against potential hazards or to caution against unsafe practices.

(b) Instruct all employees that caution signs and tags indicate a possible hazard against which proper precaution should be taken.

[97-09-013, recodified as § 296-307-33007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-33009 What are the design and color specifications for accident prevention signs?** (1) All signs must have rounded or blunt corners and be free from sharp edges. The ends or heads of bolts or other fastening devices must be located so that they do not constitute a hazard.

(2) Danger, caution, directional, informational, exit, and safety instruction signs must comply with the specification of safety colors of the ANSI Z53.1-1971.

[97-09-013, recodified as § 296-307-33009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33009, filed 10/31/96, effective 12/1/96.]

(2007 Ed.)

**WAC 296-307-33011 What are the proper uses of accident prevention tags?** (1) Use tags as a temporary means of warning employees of a hazardous condition, especially defective equipment. Tags are not a complete warning method, but should be used until the hazard can be eliminated.

For example: You may use a "do not start" tag on power equipment for a short time until the switch in the system can be locked out; you may use a "defective equipment" tag on a damaged ladder while arrangements are made for the ladder to be taken out of service and repaired.

(2) Use of accident prevention tags.

(a) Use tags as a warning to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations that are out of the ordinary, unexpected or not readily apparent.

(b) Use tags until the identified hazard is eliminated or the hazardous operation is completed. Tags are not necessary if signs, guarding, or other protection is used.

(c) Place "do not start" tags in a conspicuous location and, if possible, so that they block the starting mechanism that would cause hazardous conditions if the equipment was energized.

(3) General accident prevention tag specifications.

(a) Tags must contain a signal word and a major message. The signal word must be either "danger" or "caution."

(b) The signal word must be readable at least five feet from the hazard.

(c) The signal word and the major message must be understandable to all employees who may be exposed to the identified hazard.

(d) Inform all employees of the meaning of the tags used throughout the workplace and what special precautions are necessary.

(e) Attach tags as closely as is safely possible to the hazard. Attach the tags so as to prevent loss or unintentional removal.

(f) The tag and attachment method must be constructed of material that is not likely to deteriorate.

(4) You may use warning tags to represent a hazard level between "caution" and "danger," instead of the required "caution" tag, if they have a signal word of "warning" and an appropriate major message.

(5) Use "out of order" tags only to indicate that a piece of equipment, machinery, etc., is out of order and that it might present a hazard if used.

[97-09-013, recodified as § 296-307-33011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33011, filed 10/31/96, effective 12/1/96.]

## Part S

### Fire Protection and Ignition Sources; Exit Routes

#### WAC 296-307-340 Portable fire extinguishers.

[97-09-013, recodified as § 296-307-340, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-340, filed 10/31/96, effective 12/1/96.]

#### WAC 296-307-34003 What does this section cover?

(1) WAC 296-307-340 applies to the placement, use, maintenance, and testing of portable fire extinguishers provided for

employee use. WAC 296-307-34012 does not apply to extinguishers provided for employee use on the outside of workplace buildings or structures. If you do not intend for employees to use extinguishers, and your emergency action plan and fire prevention plan meet the requirements of WAC 296-307-35018, then only the requirements of WAC 296-307-34015 and 296-307-34018 apply.

(2) All standpipe and hose systems, automatic sprinkler systems, fixed extinguishing systems, dry-chemical fixed extinguishing systems, water-spray and foam, and fire detection systems, must be installed according to state and local ordinances, codes, and regulations governing such installations.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-34003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-34003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34006 Who is exempt from the requirements of this section?** (1) You are exempt from all requirements of this section, if:

(a) You have implemented a written fire safety policy that requires all employees to evacuate immediately when the fire alarm sounds; and

(b) You have an emergency action plan and a fire prevention plan meeting the requirements of WAC 296-307-35015 and 296-307-35018; and

(c) Extinguishers are not available for employee use in the workplace.

Note: If you are covered by one of the following sections requiring you to provide a portable fire extinguisher, then you may not apply this exemption:

- WAC 296-307-07013(12)—Transporting employees;
- WAC 296-307-34009(8)—Storage of flammables; or
- WAC 296-307-49503(2)—Welding.

(2) You are exempt from the distribution requirements in WAC 296-307-34012, if:

(a) You have an emergency action plan meeting the requirements of WAC 296-307-35015 that authorizes only certain employees to use the available portable fire extinguishers; and

(b) The plan requires all other employees to evacuate immediately when the fire alarm sounds.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-34006, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-34006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34009 What general requirements apply to portable fire extinguishers?** (1) You must provide portable fire extinguishers that are readily accessible to employees without subjecting the employees to possible injury.

(2) You must only use approved portable fire extinguishers.

(3) Portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents are prohibited.

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(4) Water type fire extinguishers with a soldered or riveted shell that use self-generating soda acid or self-generating foam or gas cartridges are prohibited.

(5) You must ensure that all portable fire extinguishers are fully charged, operable, and kept in their designated places at all times except during use.

(6) You must ensure that all portable fire extinguishers are tested, constructed, and used according to the National Fire Protection Association's pamphlet No. 10A-1970.

Note: The supplier of the extinguisher or local fire official can furnish this information.

(7) You must post "no smoking" signs in areas where fire or explosion hazards exist. You must prohibit smoking within fifty feet of all refueling operations. Take precautions to prevent open flames, sparks, or electric arcs in refueling areas.

(8) You must keep a portable fire extinguisher with a rating of at least 12-B units outside the door of any room used to store flammables or combustibles. This extinguisher must not be more than ten feet from the door.

[97-09-013, recodified as § 296-307-34009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34012 How should portable fire extinguishers be selected and distributed?** (1) You must select and distribute portable fire extinguishers based on the classes of anticipated workplace fires and on the size and degree of hazard that would affect their use.

(2) Distribution of portable fire extinguishers.

(a) For Class A fires: You must distribute portable fire extinguishers so that no employee must travel more than 75 feet (22.9 m) to a fire extinguisher.

Exception: You may use uniformly spaced standpipe systems or hose stations connected to a sprinkler system for emergency use by employees instead of Class A portable fire extinguishers, if:

- The system meets all regulatory requirements governing total coverage of the area to be protected; and
- Employees are trained at least annually in their use.

(b) For Class B fires: You must distribute portable fire extinguishers so that no employee must travel more than 50 feet (15.2 m) to a fire extinguisher.

(c) For Class C fires: You must distribute portable fire extinguishers on the basis of the appropriate pattern for the existing Class A or Class B hazards.

(d) For Class D fires: You must distribute portable fire extinguishers or other containers of Class D extinguishing agent so no employee must travel more than 75 feet (22.9 m) from the combustible metal working area to any extinguishing agent. Portable fire extinguishers for Class D hazards are required in those combustible metal working areas where combustible metal powders, flakes, shavings, or similarly sized products are generated at least once every two weeks.

[97-09-013, recodified as § 296-307-34012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34015 What are the requirements for inspection, maintenance and testing of portable fire extinguishers?** (1) You are responsible for the inspection, maintenance,

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nance, and testing of all portable fire extinguishers in the workplace.

(2) You must visually inspect portable extinguishers or hose at least once a month.

(3) You must ensure that portable fire extinguishers receive an annual maintenance check. You must keep records of the maintenance dates for one year after the previous entry or the life of the shell, whichever comes first. You must provide us with a copy of the record if we ask for it.

(4) You must ensure that stored-pressure dry chemical extinguishers that require a twelve-year hydrostatic test are emptied and undergo applicable maintenance procedures every six years.

Exception: Dry chemical extinguishers with nonrefillable disposable containers are exempt from this requirement.

The six years begins when recharging or hydrostatic testing is performed.

(5) You must ensure that alternate equivalent protection is provided when portable fire extinguishers are removed from service for maintenance and recharging.

[97-09-013, recodified as § 296-307-34015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34018 What requirements apply to hydrostatic testing?** (1) You must ensure that a trained person performs hydrostatic testing with suitable testing equipment and facilities.

(2) You must ensure that portable extinguishers are hydrostatically tested at the intervals listed in the table below.

Type of Extinguishers	Test interval (years)
Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (stainless steel shell)	5
Aqueous film forming form (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated, with mild steel shell	12

Exception: Extinguishers must not be hydrostatically tested if the following conditions exist:

- (a) When the unit has been repaired by soldering, welding, brazing, or use of patching compounds;
- (b) When the cylinder or shell threads are damaged;
- (c) When there is corrosion that has caused pitting, including corrosion under removable name plate assemblies;
- (d) When the extinguisher has been burned in a fire; or
- (e) When a calcium chloride extinguishing agent has been used in a stainless steel shell.

(3) In addition to an external visual examination, you must ensure that the cylinders and shells are examined internally before the hydrostatic testing.

(4) You must ensure that portable fire extinguishers are hydrostatically tested whenever they show new evidence of corrosion or mechanical injury.

(5) You must ensure that hydrostatic tests are performed on extinguisher hose assemblies that are equipped with a shut-off nozzle at the discharge end of the hose. The test interval must be the same as specified for the extinguisher on which the hose is installed.

(6) Carbon dioxide hose assemblies with a shut-off nozzle must be hydrostatically tested at 1,250 psi (8,620 kPa).

(7) Dry chemical and dry powder hose assemblies with a shut-off nozzle must be hydrostatically tested at 300 psi (2,070 kPa).

(8) Hose assemblies passing a hydrostatic test do not require any type of recording or stamping.

(9) You must ensure that hose assemblies for carbon dioxide extinguishers that require a hydrostatic test are tested within a protective cage device.

(10) You must ensure that carbon dioxide extinguishers and nitrogen or carbon dioxide cylinders used with wheeled extinguishers are tested every five years at 5/3 of the service pressure as stamped into the cylinder. Nitrogen cylinders that comply with 29 CFR 173.34(e)(15) may be hydrostatically tested every ten years.

(11) You must ensure that all stored pressure and Halon 1211 types of extinguishers are hydrostatically tested at the factory test pressure not to exceed two times the service pressure.

(12) You must ensure that self-generating type soda acid and foam extinguishers are tested at 350 psi (2,410 kPa).

(13) Air or gas pressure used for hydrostatic testing is prohibited.

(14) You must remove from the workplace all extinguisher shells, cylinders, or cartridges that fail a hydrostatic pressure test, or that are not fit for testing.

(15)(a) Water-jacket equipment must be used for testing compressed gas type cylinders. The equipment must have an expansion indicator that operates with an accuracy within one percent of the total expansion or 0.1 cc (.1 mL) of liquid.

(b) The following equipment must be used to test non-compressed gas type cylinders:

(i) A hydrostatic test pump, hand or power operated, capable of producing not less than one hundred fifty percent of the test pressure, which must include appropriate check valves and fittings;

(ii) A flexible connection for attachment to fittings to test through the extinguisher nozzle, test bonnet, or hose outlet, as is applicable; and

(iii) A protective cage or barrier for personal protection of the tester, designed to provide visual observation of the extinguisher under test.

(16) You must maintain records of the hydrostatic testing. Your records must include:

- The date of test;
- The test pressure used;
- The serial number, or other identifier of the fire extinguisher that was tested; and
- The person or agency performing the test.

You must keep the records until the next testing, or until the extinguisher is taken out of service, whichever comes first. You must provide us with copies of the records if we ask for them.

[97-09-013, recodified as § 296-307-34018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34018, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34021 What are the training requirements for portable fire extinguishers?** (1) If you provide portable fire extinguishers for employee use, then you must also provide training to familiarize employees with the general principles of fire extinguisher use and the hazards involved in fighting fires when they first appear.

You must provide the training when the employee is first hired and at least annually thereafter.

(2) For employees who have been designated to use fire fighting equipment as part of an emergency action plan, you must provide training in the use of the appropriate equipment.

You must provide the training upon initial assignment to the designated group of employees and at least annually thereafter.

[97-09-013, recodified as § 296-307-34021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34021, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-345 Employee alarm systems.**

[97-09-013, recodified as § 296-307-345, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-345, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-34503 What does this section cover?**

(1) WAC 296-307-345 applies to all emergency employee alarms required by a specific WAC chapter. This section does not apply to discharge or supervisory alarms required on various fixed extinguishing systems or to supervisory alarms on fire suppression, alarm or detection systems unless they are intended to be employee alarm systems.

(2) The maintenance, testing, and inspection requirements of this section apply to all local fire alarm signaling systems used for alerting employees regardless of the other functions of the system.

(3) All predischarge employee alarms required by this chapter must meet the requirements of WAC 296-307-34506 and 296-307-34512.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-34503, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-34503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34506 What general requirements apply to employee alarm systems?** (1) Your employee alarm system must provide warning for necessary emergency action called for in the emergency action plan, or safe escape of employees from the workplace.

(2) You must ensure that all employees can see or hear your employee alarm above normal noise or light levels in the workplace. You may use tactile devices to alert employees who can not see or hear the alarm.

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(3) You must ensure that your employee alarm is recognizable as an evacuation signal or signal to perform actions designated under the emergency action plan.

(4) You must explain to each employee how to report emergencies. For example: They may use manual pull box alarms, public address systems, radio or telephones. You must post emergency telephone numbers near telephones, or employee notice boards when telephones serve as a means of reporting emergencies. When your communication system also serves as the employee alarm system, you must ensure that all emergency messages have priority over all non-emergency messages.

(5) You must establish procedures for sounding emergency alarms in the workplace. If you have ten or fewer employees in a workplace, direct voice communication is an acceptable procedure for sounding the alarm if all employees can hear it. In this case, you do not need a back-up system.

[97-09-013, recodified as § 296-307-34506, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34506, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-34509 What are the installation and restoration requirements for employee alarm systems?**

(1) You must ensure that all systems installed to comply with this standard are approved. Steam whistles, air horns, strobe lights or similar lighting devices, or tactile devices meeting the requirements of this section must also be approved.

(2) After each test or alarm, you must ensure that all employee alarm systems are restored to normal operating condition as soon as possible. You must ensure that you have spare alarm components available in sufficient quantities and locations for prompt restoration of the system.

[97-09-013, recodified as § 296-307-34509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34509, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-34512 How must employee alarm systems be maintained and tested?**

(1) You must ensure that all employee alarm systems are maintained in operating condition except when undergoing repairs or maintenance.

(2) You must ensure that a test of the reliability and adequacy of nonsupervised employee alarm systems is made every two months. You must use a different actuation device in each test of a multiactuation device system so that no individual device is used for two consecutive tests.

(3) You must maintain or replace power supplies as often as necessary to ensure fully operational condition. You must provide back-up alarms, such as employee runners or telephones, when systems are out of service.

(4) You must ensure that supervised employee alarm circuitry is supervised and that it will provide positive notification to assigned personnel whenever a deficiency exists in the system. You must ensure that all supervised employee alarm systems are tested at least annually for reliability and adequacy.

(5) You must ensure that employee alarms are serviced, maintained, and tested by someone trained in the operation and functions necessary for reliable and safe operation of the system.

(2007 Ed.)

[97-09-013, recodified as § 296-307-34512, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34512, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-34515 Where must manually operated devices be located?** You must ensure that manually operated actuation devices used with employee alarms are easy to find and accessible.

[97-09-013, recodified as § 296-307-34515, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34515, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-350 Exit routes.**

[97-09-013, recodified as § 296-307-350, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-350, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-35003 What does this section cover?** WAC 296-307-350 requires you to provide exit routes for employees to leave the workplace safely during emergencies. This section does not apply to mobile workplaces, such as vehicles or vessels.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-35003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-35003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-35006 What definitions apply to this section?** "Exit" means the portion of an exit route that is generally separated from other areas to provide a protected way of travel out of the workplace.

"Exit route" means a continuous and unobstructed path of exit travel from any point within a workplace to safety outside. An exit route generally consists of three parts: Access to an exit; the area which provides a way of travel out of the workplace; and the way from the exit to the outside. An exit route includes all vertical and horizontal areas.

[97-09-013, recodified as § 296-307-35006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-35009 What are the design requirements for exit routes?** You must ensure that each workplace meets each of the following requirements:

(1) Each exit is a permanent part of the workplace.  
 (2) Two exit routes, remote from one another, are available to provide alternate means for employees to safely leave the workplace during an emergency.

(a) A single exit route is permitted where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace indicate that a single exit will allow all employees to exit safely during an emergency. Other means of escape, such as fire exits or accessible windows, should be available where fewer than two exit routes are provided.

(b) More than two exit routes are available to allow employees to safely leave the workplace during an emergency where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace reasonably suggest that reliance on two exit routes could endanger employees.

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(3) An exit has only those openings necessary to permit access to, or exit from, occupied areas of the workplace. An opening into an exit is protected by a self-closing fire door that remains closed. Each fire door, its frame, and hardware are listed or approved by a nationally recognized testing laboratory.

(4) Construction materials used to separate an exit have a 1-hour fire resistance rating if the exit connects three or fewer stories. Construction materials used to separate an exit have a 2-hour fire resistance rating if the exit connects 4 or more stories.

(5) Free and unobstructed access to each exit route is provided to ensure safe exit during an emergency.

(a) The exit route is free of material or equipment.

(b) Employees are not required to travel through a room that can be locked, such as a bathroom, or toward a dead end to reach an exit.

(c) Stairs or a ramp are used if the exit route is not substantially level.

(6) An exit leads directly outside or to a street, walkway, refuge area, or to an open space with access to the outside.

(a) The street, walkway, refuge area, or open space to which an exit leads is large enough to accommodate all building occupants likely to use that exit.

(b) A refuge area is:

(i) A space along an exit route protected from the effects of fire either by separation from other spaces within the building or by its location; or

(ii) A floor with at least two spaces separated by smoke-resistant partitions, in a building where each floor is protected by an automatic sprinkler system. An automatic sprinkler system complies with NFPA No. 13, Automatic Sprinkler Systems.

(c) Exit stairs that continue beyond the floor of exit discharge are interrupted by doors, partitions, or other effective means.

(7) Where a doorway or corner of a building is located near a railroad or trolley track so that an employee is liable to walk upon the track in front of an approaching engine or cars, a standard safeguard must be installed with a warning sign.

(8) An exit door can be readily opened from the inside without keys, tools, or special knowledge. A device, such as a panic bar, that locks only from the outside is permitted. An exit door is free of any device or alarm that, if it fails, can restrict emergency use of an exit.

Note: An exit door may be locked or blocked from the inside in a mental, penal, or correctional institution, if supervisory personnel are continually on duty and a plan exists to remove occupants during an emergency.

(9) The opening device on all doors of walk-in refrigerated or freezer rooms must be the type, when locked from the outside with a lock, can be opened from inside.

(10) A side-hinged exit door is used to connect any room to an exit route. A door that connects any room to an exit route swings out if the room may be occupied by more than 50 persons or highly flammable or explosive materials may be used inside.

(11) Each exit route supports the maximum-permitted occupant load for each floor served by the exit route. The capacity of an exit does not decrease with the direction of exit travel.

(12) Minimum height and width requirements:

(a) The ceiling for an exit route is at least 7 feet 6 inches high and the exit route is at least 6 feet 8 inches high at all points.

(b) The width of an exit route is at least 28 inches wide at all points between handrails. An exit route is wider than 28 inches if necessary to accommodate the expected occupant load.

(c) Objects that project into the exit route do not reduce the minimum height and width of an exit route.

(13) An outdoor exit route is permitted if it meets the requirements for an indoor exit route and the following additional requirements.

(a) The exit has guardrails to protect exposed sides.

(b) The exit route is covered if accumulation of snow or ice is likely and is not removed regularly.

(c) The exit route is reasonably straight with smooth, solid, substantially level floors.

(d) The exit route has no dead ends longer than 20 feet.

[97-09-013, recodified as § 296-307-35009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-35012 What are the operation and maintenance requirements for exit routes?** You must ensure that each workplace meets the following requirements:

(1) The workplace exit route is maintained to minimize danger to employees during an emergency.

(a) The workplace exit route is free of explosive or highly flammable furnishings or decorations.

(b) Accumulations of flammable or combustible waste materials are controlled.

(c) An exit route does not require employees to travel toward materials that burn very quickly, emit poisonous fumes, or are explosive, unless those materials are effectively shielded from the exit route.

(2) Each exit route is adequately lit.

(3) Each exit is clearly visible and is marked by a distinctive sign reading "exit."

(a) An exit door is free of signs or decorations that obscure its visibility.

(b) Signs are posted along the exit route indicating the direction of travel to the nearest exit.

(c) The line-of-sight to an exit sign is uninterrupted.

(d) Any doorway or passage that might be mistaken for an exit is marked "not an exit" or with an indication of its actual use.

(e) An exit sign is illuminated to a surface value of at least 5 foot candles by a reliable light source and shows a designated color. Self-luminous or electroluminescent signs have a minimum luminance surface value of .06 footlamberts.

(4) Fire retardant paints or other coatings used in the workplace are maintained.

(5) Each safeguard to protect employees during an emergency is maintained in proper working order.

(6) Employees do not occupy a workplace under construction until an exit route that meets these requirements is available for the portion of the workplace to be occupied.

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(a) Employees do not occupy a workplace during repair or alteration unless either all exits and existing fire protection are maintained or alternate fire protection is provided that ensures an equivalent level of safety.

(b) Flammable or explosive materials used during construction or repair do not expose employees to hazards not otherwise present in the workplace or impede emergency escape from the workplace.

(7) An operable employee alarm system with a distinctive signal to warn employees of fire or other emergencies is installed and maintained. No employee alarm system is required if employees can see or smell a fire or other hazard so that it would provide adequate warning to them. The employee alarm system complies with the requirements of WAC 296-307-345.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-35012, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-35012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-35015 What are the requirements for an emergency action plan?** (1) You must develop an emergency action plan for each part of the workplace as required by WAC 296-307-030 (3)(d).

(a) The plan must be in writing, kept in the workplace, and made available to employees on request.

(b) An employer of 10 or fewer employees may communicate the plan orally to employees rather than develop a written plan.

(2) An emergency action plan must include:

(a) Procedures for emergency evacuation, including exit route assignments;

(b) Procedures to account for all employees after evacuation;

(c) Procedures for reporting a fire or other emergency;

(d) Procedures to follow for emergency operation or shut down of critical equipment before evacuation;

(e) Procedures to follow for rescue and medical duties;

(f) Procedures for operating and maintaining an emergency alarm system; and

(g) Names or job titles of employees to be contacted to get more information about what to do in an emergency.

(3) You must designate employees to assist in the safe emergency evacuation of other employees. You must ensure that the designated employees receive training in emergency evacuation procedures.

(4) You must review the emergency action plan with each employee covered by the plan:

(a) When the plan is developed or the employee is assigned initially to the job;

(b) When the employee's responsibilities under the plan change; and

(c) When the plan is changed.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-35015, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-35015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-35018 What are the requirements for a fire prevention plan?** (1) You must develop a fire preven-

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tion plan for each part of the workplace if required by WAC 296-307-34006(1).

(a) The plan must be in writing, kept in the workplace, and made available to employees on request.

(b) An employer of 10 or fewer employees may communicate the plan orally to employees rather than develop a written plan.

(2) A fire prevention plan must include:

(a) A list of all major fire hazards, including proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;

(b) Procedures to control accumulations of flammable and combustible waste materials;

(c) Procedures for regular maintenance of safeguards installed on heat producing equipment to prevent accidental ignition of combustible materials;

(d) Names or job titles of employees responsible for maintaining equipment to prevent or control sources of ignition or fires;

(e) Names or job titles of employees responsible for control of fuel source hazards.

(3) You must:

(a) Inform employees of the fire hazards to which they are exposed; and

(b) Review with each employee those parts of the fire prevention plan necessary for self-protection upon initial assignment to a job.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-35018, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-35018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35018, filed 10/31/96, effective 12/1/96.]

## Part T Electrical

### WAC 296-307-360 Electrical.

[97-09-013, recodified as § 296-307-360, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-360, filed 10/31/96, effective 12/1/96.]

#### WAC 296-307-36005 What does this part cover? (1)

Chapter 296-307 WAC Part T covers methods to protect against electrical hazards in agricultural workplaces.

(2) Chapter 296-307 WAC Part T does not cover:

- Installations in watercraft, or automotive vehicles; or
- Electric welding. (See chapter 296-307 WAC Part V.)

(3) Unless otherwise provided in this chapter all electrical work, installation, and wire capacities must be according to the National Electrical Code, NFPA 70-1973; ANSI C1-1971, and all other applicable standards administered by the department of labor and industries.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-36005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-36005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36010 What definitions apply to this part?** The following definitions apply to this part:

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"Acceptable" means an installation or equipment that is acceptable to the department and meets the requirements of this section. An installation or equipment is acceptable if:

(1) It is accepted, certified, listed, labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(2) For installations or equipment that no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, it is inspected or tested by another federal agency, or by state, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and complies with the provisions of the National Electrical Code, and complies with the provisions of the National Electrical Code as applied in this section; or

(3) For custom-made equipment or related installations that are designed, fabricated for, and intended for use by a particular customer, it is determined to be safe for its intended use by its manufacturer on the basis of test data that you keep and make available for our inspection.

"Accepted" means an installation that has been inspected and certified by a nationally recognized testing laboratory to meet specified plans or procedures of applicable codes.

"Bonding jumper" means a reliable conductor that provides the correct electrical conductivity between metal parts that are required to be electrically connected.

"Branch circuits" means the part of a wiring system extending beyond the final overcurrent device protecting the circuit. A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.

"Certified" means equipment that:

- Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards, or to be safe for use in a specified manner; or

- Is a kind whose production is periodically inspected by a nationally recognized testing laboratory; and

- Bears a label, tag, or other record of certification.

"Exposed" means a live part that can be accidentally touched or approached nearer than a safe distance. This term applies to parts that are not suitably guarded, isolated, or insulated.

"Fixed equipment" means equipment fastened or connected by permanent wiring methods.

"Ground" means a conducting connection, whether intentional or accidental, between an electrical circuit or equipment and earth, or to some conducting body that serves in place of the earth.

"Grounded" means connected to earth or to some conducting body that serves in place of the earth.

"Isolated" means equipment that is not readily accessible except through special means of access.

"Labeled" means equipment that has an attached label, symbol, or other identifying mark of a nationally recognized testing laboratory that:

- Makes periodic inspections of the production of such equipment; and

- Whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.

"Qualified person" means a person who is familiar with the construction and operation of the equipment and the hazards involved.

- Note 1: Whether an employee is considered a "qualified person" depends on various circumstances in the workplace. It is possible and likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment.
- Note 2: An employee undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered a qualified person for the performance of those duties.

"Shock hazard" exists at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500 ohm load is more than 5 milliamperes.

"Weatherproof" means constructed or protected so that exposure to the weather does not interfere with successful operation. Rainproof, raintight, or watertight equipment may be considered weatherproof where weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

[97-09-013, recodified as § 296-307-36010, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36010, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-362 General electrical requirements.**

[97-09-013, recodified as § 296-307-362, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-362, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36203 What electrical equipment must be approved?** The conductors and equipment required or permitted by this section must be approved.

[97-09-013, recodified as § 296-307-36203, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36203, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36206 How must electrical equipment safety be determined?** (1) Electrical equipment must be free from hazards to employees. Safety of equipment must be determined using the following considerations:

(a) Suitability for installation and use according to the requirements of this part. Suitability of equipment for a specific purpose may be shown by listing or labeling for that purpose.

(b) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection provided.

(c) Electrical insulation.

(d) Heating effects under conditions of use.

(e) Arcing effects.

(f) Classification by type, size, voltage, current capacity, specific use.

(g) Other factors that contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(2) Listed or labeled equipment must be used or installed according to any instructions included in the listing or labeling.

[97-09-013, recodified as § 296-307-36206, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36206, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36209 What requirements apply to guarding live parts?** (1) Unless otherwise indicated, live parts of electric equipment operating at 50 volts or more must be guarded against accidental contact by an approved cabinet or other form of approved enclosure, or by any of the following:

(a) Location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(b) Suitable permanent substantial partitions or screens arranged so that only qualified persons have access to the area within reach of the live parts. Any openings in such partitions or screens must be small enough and located so that employees are not likely to come into accidental contact with live parts or to bring conducting objects into contact with them.

(c) Location on a suitable balcony, gallery, or platform elevated and accessible only to qualified persons.

(d) Elevation of eight feet or more above the floor or other working surface.

(2) In locations where electric equipment would be exposed to physical damage, enclosures or guards must be arranged and be strong enough to prevent damage.

(3) Entrances to rooms and other guarded locations containing exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter.

(4) Electrical repairs must be made only by qualified persons that you authorize.

(5) Fuse handling equipment, insulated for the circuit voltage, must be used to remove or install fuses when the fuse terminals are energized.

(6) Employees must be prohibited from working closely enough to an electric power circuit to contact it unless the employee is protected against electric shock.

Note: The circuit must be protected by deenergizing the circuit and grounding it, by guarding it, by effective insulation, or other means.

(7) In work areas where the exact location of underground electric power lines is unknown, employees using jack-hammers, bars or other hand tools that may contact a line must have insulated protective gloves.

[97-09-013, recodified as § 296-307-36209, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36209, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36212 What workspace must be provided?** (1) When parts are exposed, the minimum clearance for the workspace must be at least six feet six inches high, or at least a radius of three feet wide.

(2) There must be enough clearance to permit at least a 90° opening of all doors or hinged panels.

[97-09-013, recodified as § 296-307-36212, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36212, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36215 What general requirements apply to splices?** Conductors must be spliced or joined with splicing devices suitable for the use or by brazing, welding,

or soldering with a fusible metal or alloy. Soldered splices must first be spliced or joined so they are mechanically and electrically secure without solder and then soldered. (Rosin-core solder should be used instead of acid core solder when joining electrical conductors.) All splices and joints and the free ends of conductors must be covered with an insulation equivalent to that of the conductors or with an insulating device suitable for the purpose.

[97-09-013, recodified as § 296-307-36215, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36215, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36218 What protection must be provided against combustible materials?** Parts of electric equipment that in ordinary operation produce arcs, sparks, flames, or molten metal must be enclosed or separated and isolated from all combustible material.

[97-09-013, recodified as § 296-307-36218, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36218, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36221 How must electrical equipment be marked?** All electrical equipment in use must have the manufacturer's name, trademark, or other descriptive marking of the organization responsible for the product on the equipment. Other markings must be provided giving voltage, current, wattage, or other ratings as necessary. The marking must be durable enough to withstand the environment.

[97-09-013, recodified as § 296-307-36221, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36221, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36224 How must disconnecting means be marked?** Each disconnecting means required by this part for motors and appliances must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings must be durable enough to withstand the environment involved.

[97-09-013, recodified as § 296-307-36224, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36224, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36227 What access and working space must be provided for electrical equipment of 600 volts, nominal, or less?** Sufficient access and working space must be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(1) Unless otherwise indicated, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive must be at least that indicated in the table below. Also, workspace must be at least 30 inches wide in front of the electric equipment. Distances must be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Concrete, brick, or tile walls are considered grounded. Working space is not required behind assem-

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blies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from other directions.

Working Clearances

Nominal voltage to ground	Minimum clear distance for condition (ft)		
	(a)	(b)	(c)
0-150	13	13	3
151-600	13	3-1/2	4

Conditions:

- (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides guarded by suitable wood or other insulating material. Insulated wire or insulated busbars operating at 300 volts or less are not considered live parts.
- (b) Exposed live parts on one side and grounded parts on the other side.
- (c) Exposed live parts on both sides of the workspace (not guarded as in (a)) with the operator between.

(2) Working space required by this part must not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, must be suitably guarded.

(3) At least one entrance of sufficient area must be provided to give access to the working space about electric equipment.

(4) Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment must be at least 3 feet.

(5) All working spaces around service equipment, switchboards, panelboards, and motor control centers installed indoors must be adequately lit.

(6) The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers must be 6 feet 3 inches.

"Motor control center" means an assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

[97-09-013, recodified as § 296-307-36227, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36227, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36230 What access and working space must be provided for electrical equipment over 600 volts, nominal?** (1) Conductors and equipment used on circuits exceeding 600 volts, nominal, must meet all requirements of WAC 296-307-36221 and the additional requirements of this section. This section does not apply to equipment on the supply side of the service conductors.

(2) Electrical installations in a vault, room, closet or area surrounded by a wall, screen, or fence, with access controlled by lock and key or other approved means, are considered accessible to qualified persons only. A wall, screen, or fence less than 8 feet high is not considered to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot fence. The entrances to all buildings, rooms, or enclosures containing exposed live parts or exposed con-

ductors operating at over 600 volts, nominal, must be kept locked or under the observation of a qualified person at all times.

(a) Electrical installations with exposed live parts must be accessible to qualified persons only.

(b) Electrical installations that are open to unqualified persons must be made with metal-enclosed equipment or enclosed in a vault or in an area, with access controlled by a lock. If metal-enclosed equipment is installed so that the bottom of the enclosure is less than 8 feet above the floor, the door or cover must be kept locked. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment must be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards must be provided to prevent damage. Ventilating or similar openings in metal-enclosed equipment must be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(3) You must provide and maintain enough space around electric equipment to permit ready and safe operation and maintenance of equipment. Where energized parts are exposed, the minimum clear workspace must be at least 6 feet 6 inches high (measured vertically from the floor or platform), or less than 3 feet wide (measured parallel to the equipment). The depth must meet the requirements of Table T. The workspace must be adequate to permit at least a 90-degree opening of doors or hinged panels.

(a) The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment must be at least that specified in Table T unless otherwise indicated. Distances must be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from another direction. Where rear access is required to work on deenergized parts on the back of enclosed equipment, a minimum working space of 30 inches horizontally shall be provided.

Table T  
Minimum Depth of Clear Working Space  
in Front of Electric Equipment

Nominal voltage to ground	Conditions (ft)		
	(a)	(b)	(c)
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75kV1	6	8	10
Above 75kV1	8	10	12

Note: Minimum depth of clear working space in front of electric equipment with a nominal voltage to ground above 25,000 volts may be the same as for 25,000 volts under conditions (a), (b) and (c) for installations built prior to April 16, 1981.

Conditions:

- (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at 300 volts or less are not considered live parts.
- (b) Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls will be considered grounded surfaces.
- (c) Exposed live parts on both sides of the workspace (not guarded as in (a)) with the operator between.

(b) All working spaces around electric equipment must be adequately lit. The lighting outlets shall be arranged so that anyone changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control must be located so that no one is likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(c) Unguarded live parts above working space must be elevated to at least the height specified below:

Elevation of Unguarded  
Energized Parts Above Working Space

Nominal voltage between phases	Minimum elevation
601 to 7,500	8 feet 6 inches
7,501 to 35,000	9 feet
Over 35kV	9 feet + 0.37 inches per kV above 35kV

Note: Minimum elevation may be 8 feet for installations built prior to April 16, 1981, if the nominal voltage between phases is in the range of 601-6600 volts.

(4) Entrance and access to workspace must meet the following requirements:

(a) At least one entrance that is at least 24 inches wide and 6 feet 6 inches high must be provided to give access to the working space around electric equipment. On switchboard and control panels over 48 inches wide, there must be one entrance at each end of the board where practical. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to the entrance, they must be suitably guarded.

(b) Permanent ladders or stairways must be provided to give safe access to the working space around electric equipment installed on platforms, balconies, mezzanine floors, or in attic or roof rooms or spaces.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-36230, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-36230, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36230, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-364 Electrical installation and maintenance.**

[97-09-013, recodified as § 296-307-364, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-364, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36403 How must flexible cords and cables be installed and maintained?** (1) Extension cords used with portable electric tools and appliances must be three wire and must be fitted with an approved grounding attachment plug and receptacle providing ground continuity.

Exception: This does not apply to cords used with portable tools and equipment provided by an approved system of double insulation or its equivalent.

(2) Worn or frayed electric cables are prohibited.

[97-09-013, recodified as § 296-307-36403, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36403, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36406 How must attachment plugs and receptacles be installed and maintained?** (1) Attachment plugs used in work areas must be constructed so that they will endure rough use and have a suitable cord grip to prevent strain on the terminal screws.

(2) Attachment plugs must be approved grounding plugs.

(3) Receptacles for attachment plugs must have approved concealed contacts with a contact for extending ground continuity. Receptacles must be designed and constructed to ensure that the plug can be pulled out without leaving any live parts exposed to accidental contact.

(4) Polarized attachment plugs, receptacles, and cord connectors must be wired to maintain continuity.

(5) Polarized attachment plugs, receptacles, and cord connectors for plugs and polarized plugs must have the terminal intended for connection to the grounded (white) conductor identified by a metal coating that is mostly white. If the terminal is not visible, its entrance hole must be marked with the word "white," or the color white.

(6) The terminal for the connection of the equipment grounding conductor must be:

(a) A green colored, not easily removed terminal screw with hexagonal head; or

(b) A green colored, hexagonal, not easily removed terminal nut; or

(c) A green colored pressure wire connector.

If the terminal for the grounding conductor is not visible, the conductor entrance hole must be marked with the word "green" or the color green.

Note: Two-wire attachment plugs, unless of the polarity type, need not have their terminals marked for identification.

(7) Where different voltages, or types of current (A.C. or D.C.) are to be supplied by portable cords, receptacles must be designed so that attachment plugs used on the circuits are not interchangeable.

(8) Attachment plugs or other connectors supplying equipment at more than 300 volts must be skirted or otherwise designed so that arcs are confined.

[97-09-013, recodified as § 296-307-36406, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36406, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36409 What must employees do when equipment causes electrical shock?** Employees must report all shocks received from electrical equipment, no matter how slight, immediately to you. The equipment causing the shock

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must be checked and any necessary corrective action taken immediately.

[97-09-013, recodified as § 296-307-36409, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36409, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36412 What grounding and bonding requirements apply to equipment installation and maintenance?** (1) The path to ground must have enough carrying capacity to conduct safely the currents likely to be imposed on it; and have low enough impedance to limit the potential above ground and to result in the operation of the overcurrent devices in the circuit.

(2) Driven rod electrodes must, where practical, have a resistance to ground of a maximum of 25 ohms. Where the resistance is over 25 ohms, two electrodes connected in parallel shall be used.

(3) Grounding circuits must be checked to ensure that the circuit between the ground and the grounded power conductor has a resistance that is low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(4) Conductors used for bonding and grounding equipment must be large enough to carry the anticipated current.

[97-09-013, recodified as § 296-307-36412, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36412, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36415 What requirements apply to disconnecting means?** (1) Disconnecting means must be located or shielded so that employees will not be injured. Using open knife switches is prohibited.

(2) Boxes for disconnecting means must be securely and rigidly fastened to the surface upon which they are mounted, and fitted with covers.

[97-09-013, recodified as § 296-307-36415, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36415, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36418 What requirements apply to identification and load rating of electrical equipment?** (1) Name plates, rating data, and marks of identification on electrical equipment and electrically operated machines must not be removed, defaced or obliterated.

(2) In existing installations, no changes in circuit protection must be made to increase the load beyond the load rating of the circuit wiring, as specified in the National Electrical Code, NFPA 70-1973; ANSI C1-1972, Article 310.

(3) Tampering with, bridging, or using oversize fuses is prohibited. If fuses blow repeatedly, employees must immediately report the trouble to you or to an authorized electrician.

(4) Attempting to start electric motors that kick out repeatedly is prohibited.

[97-09-013, recodified as § 296-307-36418, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36418, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36421 How must equipment be installed in wet locations?** (1) Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet loca-

tions must be installed to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures must be weatherproof.

(2) Switches, circuit breakers, and switchboards installed in wet locations must be enclosed in weatherproof enclosures.

[97-09-013, recodified as § 296-307-36421, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36421, filed 10/31/96, effective 12/1/96.]

### **WAC 296-307-366 Wiring design and protection.**

[97-09-013, recodified as § 296-307-366, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-366, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36603 How must grounded and grounding conductors be used and identified?** (1) A conductor used as a grounded conductor must be identified separately from all other conductors. A conductor used as an equipment grounding conductor must be identified separately from all other conductors.

(2) A grounded conductor must not be attached to any terminal or lead to reverse the designated polarity.

(3) Using a grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug for anything other than grounding is prohibited.

[97-09-013, recodified as § 296-307-36603, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36603, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36606 What ampere rating must outlet devices have?** Outlet devices must have an ampere rating at least equal to the load served.

[97-09-013, recodified as § 296-307-36606, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36606, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36609 What requirements apply to conductors?** This section applies to branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors.

(1) Conductors supported on poles must provide a horizontal climbing space of at least the following:

(a) For power conductors below communication conductors, 30 inches.

(b) For power conductors alone or above communication conductors:

- 300 volts or less, 24 inches;
- More than 300 volts, 30 inches.

(c) For communication conductors below power conductors with power conductors of:

- 300 volts or less, 24 inches;
- More than 300 volts, 30 inches.

(2) Open conductors must provide at least the following minimum clearances:

(a) 10 feet, above finished grade, sidewalks, or from any platform or projection from which they might be reached;

(b) 12 feet, over areas subject to vehicular traffic other than truck traffic;

(c) 15 feet, over areas that are subject to truck traffic; except

(d) 18 feet, over public streets, alleys, roads, and driveways.

(3) Conductors must have a clearance of at least 3 feet from windows, doors, porches, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet away.

(4) Conductors must have a clearance of at least 8 feet from the highest point of roofs they pass over.

Exceptions: (a) Where the voltage between conductors is 300 volts or less and the roof has a slope of at least 4 inches in 12, the clearance from the roofs must be at least 3 feet; or

(b) Where the voltage between conductors is 300 volts or less, the conductors do not pass over more than 4 feet of the overhang portion of the roof, and they are terminated at a through-the-roof raceway or approved support, the clearance from the roofs must be at least 18 inches.

(5) Lamps for outdoor lighting must be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

[97-09-013, recodified as § 296-307-36609, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36609, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36612 What design and protection requirements apply to service-entrances?** (1) Disconnecting means for service-entrances must meet the following requirements:

(a) Means must be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means must plainly indicate whether it is in the open or closed position and must be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(b) Each service disconnecting means must disconnect all ungrounded conductors at the same time.

(2) The following additional requirements apply to services over 600 volts, nominal.

(a) Service-entrance conductors installed as open wires must be guarded to make them accessible only to qualified persons.

(b) Signs warning of high voltage must be posted where other than qualified employees might come in contact with live parts.

[97-09-013, recodified as § 296-307-36612, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36612, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36615 What overcurrent protection must be provided?** (1) The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

(a) Conductors and equipment must be protected from overcurrent according to their ability to safely conduct current.

(b) Except for motor running overload protection, overcurrent devices must not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened at the same time.

(c) Except for service fuses, all cartridge fuses that are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground must have disconnecting means. This disconnecting means must be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(d) Overcurrent devices must be readily accessible to each employee or authorized building management personnel. These overcurrent devices must be located where they will be protected against physical damage and away from easily ignitable material.

(e) Fuses and circuit breakers must be located or shielded so that employees will not be burned or otherwise injured by their operation.

(f) Circuit breakers must meet the following requirements:

(i) Circuit breakers must clearly indicate whether they are in the open (off) or closed (on) position.

(ii) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle must be the closed (on) position.

(iii) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers must be approved for the purpose and marked "SWD."

(2) Feeders and branch circuits over 600 volts, nominal, must have short-circuit protection.

[97-09-013, recodified as § 296-307-36615, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36615, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36618 What premises wiring systems must be grounded?** The following systems that supply premises wiring must be grounded:

(1) All 3-wire DC systems must have their neutral conductor grounded.

(2) Two-wire DC systems operating at 50-300 volts between conductors must be grounded.

Exceptions: This requirement does not apply if:

- (a) They supply only industrial equipment in limited areas and are equipped with a ground detector; or
- (b) They are rectifier-derived from an AC system that meets the requirements of subsections (3), (4), and (5) of this section; or
- (c) They are fire-protective signaling circuits with a maximum current of 0.030 amperes.

(3) AC circuits of less than 50 volts must be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(4) AC systems of 50-1000 volts must be grounded under any of the following conditions:

(a) If the system can be grounded so that the maximum voltage to ground on the ungrounded conductors is a maximum of 150 volts;

(b) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

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(c) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(d) If a service conductor is uninsulated.

(5) Exceptions: AC systems of 50-1000 volts are not required to be grounded under any of the following conditions:

(a) If the system is used exclusively to supply industrial electric furnaces for melting, refining, tempering, and the like.

(b) If the system is separately derived and is used exclusively for rectifiers supplying only adjustable speed industrial drives.

(c) If the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, if all of the following conditions are met:

(i) The system is used exclusively for control circuits;

(ii) The conditions of maintenance and supervision ensure that only qualified persons will service the installation;

(iii) Continuity of control power is required; and

(iv) Ground detectors are installed on the control system.

[97-09-013, recodified as § 296-307-36618, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36618, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36621 Must the conductor be grounded for AC premises wiring?** For AC premises wiring systems the identified conductor must be grounded.

[97-09-013, recodified as § 296-307-36621, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36621, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36624 What general requirements apply to grounding conductors?** (1) For a grounded system, a grounding electrode conductor must be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor must be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(2) For an ungrounded service-supplied system, the equipment grounding conductor must be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor must be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(3) On extensions of existing branch circuits that do not have an equipment grounding conductor, grounding-type receptacles may be grounded to a grounded cold water pipe near the equipment.

(4) On extensions of existing branch circuits that do not have an equipment grounding conductor, grounding-type receptacles may be grounded to a grounded cold water pipe near the equipment.

[97-09-013, recodified as § 296-307-36624, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36624, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36627 Must the path to ground be continuous?** The path to ground from circuits, equipment, and enclosures must be permanent and continuous.

[Title 296 WAC—p. 2471]

[97-09-013, recodified as § 296-307-36627, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36627, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36630 What supports, enclosures, and equipment must be grounded?** (1) Metal cable trays, metal raceways, and metal enclosures for conductors must be grounded.

Exceptions: (a) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; or

(b) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

(i) Runs are less than 25 feet;

(ii) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(iii) Enclosures are guarded against employee contact.

(2) Metal enclosures for service equipment must be grounded.

(3) Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and metal outlet or junction boxes that are part of the circuit for these appliances must be grounded.

(4) Exposed noncurrent-carrying metal parts of fixed equipment that may become energized must be grounded under any of the following conditions:

(a) If within 8 feet vertically or 5 feet horizontally of ground or grounded metal objects and subject to employee contact;

(b) If located in a wet or damp location and not isolated;

(c) If in electrical contact with metal;

(d) If in a hazardous (classified) location;

(e) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method;

(f) If equipment operates with any terminal at over 150 volts to the ground; however, the following need not be grounded:

(i) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(ii) Metal frames of electrically heated appliances that are permanently and effectively insulated from ground; and

(iii) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles that are over 8 feet above ground or grade level.

(5) Under any of the conditions below, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment that may become energized must be grounded.

(a) When equipment is in hazardous (classified) locations.

(b) When equipment is operated at over 150 volts to ground.

Exception: Guarded motors and metal frames of electrically heated appliances need not be grounded if the appliance frames are permanently and effectively insulated from ground.

(c) When equipment is one of the following:

• Refrigerators, freezers, and air conditioners;

• Clothes-washing, clothes-drying and dishwashing machines, sump pumps, and electrical aquarium equipment;

• Hand-held motor-operated tools;

• The following motor-operated appliances: Hedge clippers, lawn mowers, snow blowers, and wet scrubbers;

• Cord-connected and plug-connected appliances used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;

• Tools likely to be used in wet and conductive locations; and

• Portable hand lamps.

Tools likely to be used in wet and conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of a maximum of 50 volts. Listed or labeled portable tools and appliances protected by an approved system of double insulation, or its equivalent, need not be grounded. The equipment must be distinctively marked to indicate that the tool or appliance uses an approved system of double insulation.

(6) The metal parts of the following nonelectrical equipment must be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and other metal enclosures around equipment of over 750 volts between conductors.

[97-09-013, recodified as § 296-307-36630, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36630, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36633 How must fixed equipment be grounded?** (1) Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this section, must be grounded by an equipment grounding conductor that is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(2) Electric equipment is considered grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded as described above.

For installations made before May 30, 1982, electric equipment is also considered grounded if it is secured to, and in metallic contact with, the grounded structural metal frame of a building. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered grounded.

[97-09-013, recodified as § 296-307-36633, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36633, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36636 How must high voltage systems be grounded?** Grounded high voltage (1000 volts or more) systems and circuits must meet all requirements of WAC 296-307-366 and the additional requirements of this section.

(1) Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, must meet the following requirements:

(a) Portable and mobile high voltage equipment must be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is

used to supply the equipment, a system neutral must be derived.

(b) Exposed noncurrent-carrying metal parts of portable and mobile equipment must be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(c) Ground-fault detection and relaying must be provided to automatically deenergize any high voltage system component that has developed a ground fault. The continuity of the equipment grounding conductor must be continuously monitored to deenergize automatically the high voltage feeder to the portable equipment on loss of continuity of the equipment grounding conductor.

(d) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected must be isolated from and separated in the ground by at least 20 feet from any other system or equipment grounding electrode. There must be no direct connection between the grounding electrodes, such as buried pipe, fence, etc.

(2) All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment that is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus over 8 feet above ground or grade level need not be grounded.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-36636, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-36636, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36636, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-368 Wiring methods, components, and equipment for general use.**

[97-09-013, recodified as § 296-307-368, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-368, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36803 Does this section apply to factory-assembled equipment?** WAC 296-307-368 does not apply to conductors that are an integral part of factory-assembled equipment.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-36803, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-36803, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-307-36803, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36806 What wiring methods must be used for temporary wiring?** Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. All requirements for permanent wiring apply to temporary wiring installations, except as indicated in this section.

(1) Temporary electrical power and lighting installations 600 volts, nominal, or less must only be used:

(a) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

(b) For experimental or development work; and

(c) For a maximum of 90 days for Christmas lighting and similar purposes.

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(2) Temporary wiring over 600 volts, nominal, must only be used during periods of tests, experiments, or emergencies.

(3) General requirements for temporary wiring.

(a) Working spaces, walkways, and similar locations must be kept clear of power cords.

(b) All temporary wiring must be grounded. (See NFPA 70 Art. 250.)

(c) All wiring equipment must be maintained as vapor-tight, dust-tight, or fiber-tight as their approval requires. There must be no loose or missing screws, gaskets, threaded connections, or other conditions that impair the required tightness.

(d) Take precautions to make necessary open wiring accessible only to authorized personnel.

(e) Feeders must originate in an approved distribution center. The conductors must be run as multiconductor cord or cable assemblies, or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet apart.

(f) Branch circuits must originate in an approved power outlet or panelboard. Conductors must be multiconductor cord or cable assemblies or open conductors. If run as open conductors they must be fastened at ceiling height every 10 feet. A branch-circuit conductor must not be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment must have a separate equipment grounding conductor if run as open conductors.

(g) Receptacles must be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit must have a separate equipment grounding conductor and all receptacles must be electrically connected to the grounding conductor.

(h) A bare conductor or an earth return must not be used to wire any temporary circuit.

(i) Suitable disconnecting switches or plug connectors must be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(j) Lamps for general illumination must be protected from accidental contact or breakage. Lamps must be elevated at least 7 feet from normal working surface or by a suitable fixture or lampholder with a guard.

(k) Flexible cords and cables must be protected from accidental damage. Sharp corners and projections must be avoided. Where passing through doorways or other pinch points, flexible cords and cables must be protected to avoid damage.

(4) General requirements for temporary lighting.

(a) Temporary lights must have guards to prevent accidental contact with the bulb.

Note: Guards are not required when the entire bulb is below the rim and completely surrounded and protected by the reflector.

(b) Temporary lights must have heavy duty electric cords with connections and insulation maintained in safe condition.

(c) Temporary lights must not be suspended by their electric cords unless cords and lights are designed for suspension.

(d) Brass shell, paper-lined lamp holders are prohibited.

(e) Portable extension lamps used where flammable vapors or gases, combustible dusts, or easily ignitable fibers

or flyings are present, must be specifically approved as complete assemblies for the type of hazard.

[97-09-013, recodified as § 296-307-36806, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-307-36806, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36809 When may cable trays be used?**

- (1) Only the following may be installed in cable tray systems:
- (a) Mineral-insulated metal-sheathed cable (Type MI);
  - (b) Armored cable (Type AC);
  - (c) Metal-clad cable (Type MC);
  - (d) Power-limited tray cable (Type PLTC);
  - (e) Nonmetallic-sheathed cable (Type NM or NMC);
  - (f) Shielded nonmetallic-sheathed cable (Type SNM);
  - (g) Multiconductor service-entrance cable (Type SE or USE);
  - (h) Multiconductor underground feeder and branch-circuit cable (Type UF);
  - (i) Power and control tray cable (Type TC);
  - (j) Other factory-assembled, multiconductor control, signal, or power cables that are specifically approved for installation in cable trays; or
  - (k) Any approved conduit or raceway with its contained conductors.

(2) In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons will service the installed cable tray system, the following cables may also be installed in ladder, ventilated trough, or 4 inch ventilated channel-type cable trays:

Single conductor cables that are 250 MCM or larger and are Types RHH, RHW, MV, USE, or THW, and other 250 MCM or larger single conductor cables if specifically approved for installation in cable trays. Where exposed to direct rays of the sun, cables must be sunlight-resistant.

(3) Cable trays in hazardous (classified) locations must contain only the cable types permitted in such locations.

Exception: Cable tray systems must not be used in hoistways or where subjected to severe physical damage.

[97-09-013, recodified as § 296-307-36809, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36809, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36812 What requirements apply to open wiring on insulators?** (1) Open wiring on insulators is only permitted on systems of 600 volts, nominal, or less for industrial or agricultural establishments and for services.

(2) Conductors must be rigidly supported on noncombustible, nonabsorbent insulating materials and must not contact any other objects.

(3) In dry locations with no exposure to severe physical damage, conductors may be separately enclosed in flexible nonmetallic tubing. The tubing must be in continuous lengths a maximum of 15 feet and secured to the surface by straps at maximum intervals of 4 feet 6 inches.

(4) Open conductors must be separated from contact with walls, floors, and wood cross members, or partitions through which they pass by tubes or bushings of noncombustible, nonabsorbent insulating material. If the bushing is shorter than the hole, a waterproof sleeve of nonconductive material must be inserted in the hole and an insulating bushing slipped into the sleeve at each end to keep the conductors

completely out of contact with the sleeve. Each conductor must be carried through a separate tube or sleeve.

(5) Conductors within 7 feet of the floor are considered exposed to physical damage. Where open conductors cross ceiling joints and wall studs and are exposed to physical damage, they must be protected.

[97-09-013, recodified as § 296-307-36812, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36812, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36815 What wiring requirements apply to cabinets, boxes, and fittings?**

(1) Conductors entering boxes, cabinets, or fittings must be protected from abrasion, and openings through which conductors enter must be closed. Unused openings in cabinets, boxes, and fittings must also be closed.

(2) All pull boxes, junction boxes, and fittings must have covers approved for the purpose. All metal covers must be grounded. In completed installations each outlet box must have a cover, faceplate, or fixture canopy. A cover of an outlet box with holes through which a flexible cord pendant passes must have bushings designed for the purpose or have a smooth, well-rounded surface for the cord to run on.

(3) All pull and junction boxes for systems over 600 volts, nominal, must meet the following requirements:

(a) Boxes must provide a complete enclosure for the contained conductors or cables.

(b) Boxes must be closed by suitable covers securely fastened in place. Underground box covers that weigh over 100 pounds meet this requirement. Covers for boxes must be permanently marked "HIGH VOLTAGE." The marking must be on the outside of the box cover and must be readily visible and legible.

[97-09-013, recodified as § 296-307-36815, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36815, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36818 What requirements apply to switches?**

(1) Single-throw knife switches must be connected so that the blades are dead when the switch is in the open position. Single-throw knife switches must be placed so that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position must have a locking device that keeps the blades open when set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical a locking device must be provided to ensure that the blades remain open when so set.

(2) Flush snap switches that are mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces must have faceplates of nonconducting, noncombustible material.

[97-09-013, recodified as § 296-307-36818, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36818, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36821 Where must switchboards and panelboards be located?** Switchboards that have any exposed live parts must be located in permanently dry locations and accessible only to qualified persons. Panelboards must be mounted in cabinets, cutout boxes, or enclosures

approved for the purpose and must be dead front. However, panelboards other than the dead front externally operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches must be dead when open.

[97-09-013, recodified as § 296-307-36821, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36821, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36824 When must conductors be insulated?** All conductors used for general wiring must be insulated unless otherwise permitted in this section. The conductor insulation must be approved for the voltage, operating temperature, and location of use. Insulated conductors must be distinguishable by appropriate color or other means as grounded conductors, ungrounded conductors, or equipment grounding conductors.

[97-09-013, recodified as § 296-307-36824, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36824, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36827 When may flexible cords and cables be used?** (1) Flexible cords and cables must be approved and suitable for conditions of use and location. Flexible cords and cables must be used only for:

- (a) Pendants;
- (b) Wiring of fixtures;
- (c) Connection of portable lamps or appliances;
- (d) Elevator cables;
- (e) Wiring of cranes and hoists;
- (f) Connection of stationary equipment to facilitate frequent interchange;
- (g) Prevention of the transmission of noise or vibration;
- (h) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair; or
- (i) Data processing cables approved as a part of the data processing system.

(2) If used as permitted above, the flexible cord must have an attachment plug and shall be energized from an approved receptacle outlet.

(3) Unless permitted in subsection (1) of this section, flexible cords and cables must not be used:

- (a) As a substitute for the fixed wiring of a structure;
- (b) Where run through holes in walls, ceilings, or floors;
- (c) Where run through doorways, windows, or similar openings;
- (d) Where attached to building surfaces; or
- (e) Where concealed behind building walls, ceilings, or floors.

(4) Flexible cords used in show windows and showcases must be Type S, SO, SJ, SJO, ST, STO, SJT, SJTO, or AFS except for the wiring of chain-supported lighting fixtures and supply cords for portable lamps and other merchandise being displayed or exhibited.

[97-09-013, recodified as § 296-307-36827, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36827, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36830 How must flexible cords and cables be identified, spliced, and terminated?** (1) A conductor of a flexible cord or cable that is used as a grounded

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conductor or an equipment grounding conductor must be distinguishable from other conductors. Types SJ, SJO, SJT, SJTO, S, SO, ST, and STO must be durably marked on the surface with the type designation, size, and number of conductors.

(2) Flexible cords must be used only in continuous lengths without splice or tap. Vulcanized splices or equivalent means such as systems using shrinkable materials may be used to repair flexible cords. Hard service flexible cords No. 12 or larger may be repaired by splice if the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(3) Flexible cords must be connected to devices and fittings so that strain relief is provided to prevent pull from being directly transmitted to joints or terminal screws.

[97-09-013, recodified as § 296-307-36830, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36830, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36833 What requirements apply to multiconductor portable cable?** Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, must consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2,000 volts must be shielded to confine the voltage stresses to the insulation. Grounding conductors must be provided. Connectors for these cables must be locking with provisions to prevent their opening or closing while energized. Strain relief must be provided at connections and terminations. Portable cables must not be operated with splices unless the splices are permanent molded, vulcanized, or other approved type. Termination enclosures must be suitably marked with a high voltage hazard warning, and terminations must be accessible only to authorized and qualified personnel.

[97-09-013, recodified as § 296-307-36833, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36833, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36836 When may fixture wires be used?** (1) A fixture wire must be approved for the voltage, temperature, and location of use. A fixture wire used as a grounded conductor must be identified.

(2) Fixture wires may be used:

(a) For installation in lighting fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(b) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(3) Fixture wires must not be used as branch-circuit conductors except as permitted for Class 1 power limited circuits.

[97-09-013, recodified as § 296-307-36836, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36836, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36839 What requirements apply to wiring for lighting fixtures, lampholders, lamps, and receptacles?** (1) Fixtures, lampholders, lamps, rosettes, and receptacles must have no live parts normally exposed to employee contact. However, rosettes and cleat-type lam-

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holders and receptacles located at least 8 feet above the floor may have exposed parts.

(2) Handlamps of the portable type supplied through flexible cords must have a handle of molded composition or other material approved for the purpose, and a substantial guard must be attached to the lampholder or the handle.

(3) Lampholders of the screw-shell type must be installed for use as lampholders only. Lampholders installed in wet or damp locations must be weatherproof.

(4) Fixtures installed in wet or damp locations must be approved for the purpose and must be constructed or installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

[97-09-013, recodified as § 296-307-36839, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36839, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36842 What requirements apply to wiring for receptacles, cord connectors, and attachment plugs (caps)?** (1) Receptacles, cord connectors, and attachment plugs must be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating.

(2) A receptacle installed in a wet or damp location must be suitable for the location.

[97-09-013, recodified as § 296-307-36842, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36842, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36845 What requirements apply to wiring for appliances?** (1) Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, must have no live parts normally exposed to employee contact.

(2) Each appliance must have a disconnecting means.

(3) Each appliance must be marked with its rating in volts and amperes or volts and watts.

[97-09-013, recodified as § 296-307-36845, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36845, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36848 What requirements apply to wiring for motors, motor circuits, and controllers?** (1) If specified that one piece of equipment must be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet from the other.

(2) Disconnecting means must meet the following requirements:

(a) A disconnecting means must be located in sight from the controller location. However, a single disconnecting means may be located adjacent to a group of coordinated controllers mounted adjacent to each other or a multimotor continuous process machine. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(b) The disconnecting means must disconnect the motor and the controller from all ungrounded supply conductors and must be designed so that no pole can be operated independently.

(c) If a motor and the driven machinery are not in sight from the controller location, the installation must meet one of the following conditions:

(i) The controller disconnecting means must be able to be locked in the open position.

(ii) A manually operable switch that will disconnect the motor from its source of supply must be placed in sight from the motor location.

(d) The disconnecting means must plainly indicate whether it is in the open (off) or closed (on) position.

(e) The disconnecting means must be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(f) An individual disconnecting means must be provided for each motor, but a single disconnecting means may be used for a group of motors under any of the following conditions:

(i) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist; or

(ii) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(iii) If a group of motors is in a single room in sight from the location of the disconnecting means.

(3) Motors, motor-control apparatus, and motor branch-circuit conductors must be protected against overheating from motor overloads or failure to start, and against short-circuits or ground faults. Overload protection is not required if it will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(4) Live parts of all voltages must be protected according to the following:

(a) Stationary motors with commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground may have those parts unguarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals must be guarded against accidental contact by any of the following:

(i) By installation in a room or enclosure that is accessible only to qualified persons;

(ii) By installation on a suitable balcony, gallery, or platform, elevated and arranged to exclude unqualified persons; or

(iii) By elevation 8 feet or more above the floor.

(b) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, suitable insulating mats or platforms must be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

[97-09-013, recodified as § 296-307-36848, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36848, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36851 What requirements apply to wiring for transformers?** (1) This section applies to the installation of all transformers.

Exception: (a) Current transformers;  
 (b) Dry-type transformers installed as a component part of other apparatus;  
 (c) Transformers that are an integral part of a high frequency or electrostatic-coating apparatus;  
 (d) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits; and  
 (e) Liquid-filled or dry-type transformers used for research, development, or testing, where effective safeguard arrangements are provided.

(2) The operating voltage of exposed live parts of transformer installations must be indicated by warning signs or visible markings on the equipment or structure.

(3) Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35kV must be in a vault.

(4) If they present a fire hazard to employees, oil-insulated transformers installed indoors must be in a vault.

(5) Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings must be safeguarded from fires that may originate in oil-insulated transformers attached or adjacent to a building or combustible material.

(6) Transformer vaults must be constructed to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches must be arranged so that a vault door can be readily opened from the inside.

(7) Any pipe or duct system foreign to the vault installation must not enter or pass through a transformer vault.

(8) Materials must not be stored in transformer vaults.

[97-09-013, recodified as § 296-307-36851, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36851, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36854 What requirements apply to wiring for capacitors?** (1) All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, must have an automatic means of draining the stored charge after the capacitor is disconnected from its source of supply.

(2) Capacitors rated over 600 volts, nominal, must meet the following additional requirements:

(a) Isolating or disconnecting switches (with no interrupting rating) must be interlocked with the load interrupting device or must have prominently displayed caution signs to prevent switching load current.

(b) For series capacitors, the proper switching must be ensured by any of the following:

(i) Mechanically sequenced isolating and bypass switches;

(ii) Interlocks; or

(iii) Switching procedure prominently displayed at the switching location.

[97-09-013, recodified as § 296-307-36854, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36854, filed 10/31/96, effective 12/1/96.]

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**WAC 296-307-36857 How must storage batteries be ventilated?** You must ensure that there is sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures.

[97-09-013, recodified as § 296-307-36857, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36857, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-36860 What other miscellaneous requirements apply to wiring methods?** (1) Metal raceways, cable armor, and other metal enclosures for conductors must be metallically joined into a continuous electric conductor and must be connected to all boxes, fittings, and cabinets to provide effective electrical continuity.

(2) All wiring systems are prohibited from being installed in ducts used to transport dust, loose stock or flammable vapors. All wiring system are prohibited from being installed in any duct used for vapor removal or for ventilation of commercial-type cooking equipment, or in any shaft containing only such ducts.

[97-09-013, recodified as § 296-307-36860, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36860, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-370 Special purpose equipment and installations.**

[97-09-013, recodified as § 296-307-370, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-370, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37003 What requirements apply to cranes, hoists, and runways?** The installation of electric equipment and wiring used with cranes, monorail hoists, hoists, and all runways must meet the following requirements:

(1) Disconnecting means must meet the following requirements:

(a) A readily accessible disconnecting means is provided between the runway contact conductors and the power supply.

(b) Another disconnecting means, capable of being locked in the open position, is provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(i) If this additional disconnection means is not readily accessible from the crane or monorail hoist operating station, means is provided at the operating station, to open the power circuit to all motors of the crane or monorail hoist.

(ii) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(A) The unit is floor controlled;

(B) The unit is within view of the power supply disconnecting means; and

(C) No fixed work platform has been provided for servicing the unit.

(2) A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(3) The dimension of the working space in the direction of access to live parts that may require examination, adjust-

ment, servicing, or maintenance while alive must be a minimum of 2 feet 6 inches. Where controls are enclosed in cabinets, the door must either open at least 90 degrees or be removable.

[97-09-013, recodified as § 296-307-37003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37006 What requirements apply to elevators, dumbwaiters, escalators, and moving walks?**

(1) Elevators, dumbwaiters, escalators, and moving walks must have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(2) If interconnections between control panels are necessary for operation of the system on a multicar installation that remains energized from a source other than the disconnecting means, a warning sign must be mounted on or adjacent to the disconnecting means. The sign must be clearly legible and shall read "Warning—Parts of the control panel are not deenergized by this switch."

(3) If control panels are not located in the same space as the drive machine, they must be located in cabinets with doors or panels capable of being locked closed.

[97-09-013, recodified as § 296-307-37006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37009 What requirements apply to the disconnecting means for electric welders?** (1) A disconnecting means must be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder that is not equipped with a disconnect mounted as an integral part of the welder.

(2) A switch or circuit breaker must be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means must not be less than the supply conductor ampacity.

[97-09-013, recodified as § 296-307-37009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37012 What requirements apply to electrically driven or controlled irrigation machines?** (1) If an electrically driven or controlled irrigation machine has a stationary point, a driven ground rod must be connected to the machine at the stationary point for lightning protection.

(2) The main disconnecting means for a center pivot irrigation machine must be located at the point of connection of electrical power to the machine and must be readily accessible and capable of being locked in the open position. A disconnecting means must be provided for each motor and controller.

[97-09-013, recodified as § 296-307-37012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-372 Hazardous (classified) locations.**

[97-09-013, recodified as § 296-307-372, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-372, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2478]

**WAC 296-307-37203 What does this section cover?** WAC 296-307-372 covers the requirements for electric equipment and wiring in locations that are classified based on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers that may be present and the likelihood that a flammable combustible concentration or quantity is present. Each room, section, or area must be considered individually to determine its classification.

All requirements in this part apply to hazardous locations, unless otherwise indicated.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37203, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37203, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37203, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37206 What classifications apply to this section?** These hazardous locations are classified as follows:

(1) "Class I locations" are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. They include the following:

(a) Class I, Division 1 locations are those where:

(i) Hazardous concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) Hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) Breakdown or faulty operation of equipment or processes might release hazardous concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

This classification usually includes locations where:

- Volatile flammable liquids or liquefied flammable gases are transferred from one container to another;

- Interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used;

- Locations containing open tanks or vats of volatile flammable liquids;

- Drying rooms or compartments for the evaporation of flammable solvents;

- Locations containing fat and oil extraction equipment using volatile flammable solvents;

- Gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape;

- Inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids;

- The interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers; and

- All other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2 locations are those where:

(i) Volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases are normally confined within closed containers or systems from which they can escape only in an

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accidental rupture or breakdown of containers or systems, or in case of abnormal operation of equipment; or

(ii) Hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operation of the ventilating equipment; or

(iii) They are adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

This classification usually includes locations where:

- Volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors to consider in determining the classification.

- Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers are not normally considered hazardous unless also subject to other hazardous conditions.

- Electrical conduits and their enclosures separated from process fluids by a single seal or barrier are Division 2 locations if the outside of the conduit and enclosures is a nonhazardous location.

(2) "Class II locations" are those that are hazardous because of the presence of combustible dust. They include the following:

(a) Class II, Division 1 locations are those where:

(i) Combustible dust is or may be suspended in the air under normal operating conditions, in quantities sufficient to produce explosives or ignitable mixtures; or

(ii) Mechanical failure or abnormal operation of machinery or equipment might produce explosive or ignitable, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) Combustible dusts of an electrically conductive nature may be present.

This classification may include areas of grain handling and processing plants, starch plants, sugar-pulverizing plants, malting plants, hay-grinding plants, coal pulverizing plants, areas where metal dusts and powders are produced or processed, and other similar locations that contain dust producing machinery and equipment (except where the equipment is dust-tight or vented to the outside). These areas would have combustible dust in the air, under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures.

Combustible dusts that are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and wood flour, oil meal from beans and seed, dried

hay, and other organic materials that may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2 location are those where:

(i) Combustible dust is not normally suspended in the air in quantities sufficient to produce explosive or ignitable mixtures; and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and resulting dust accumulations may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location into which an explosive or ignitable concentration of dust may be suspended under abnormal operating conditions.

(3) "Class III locations" are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be suspended in the air in quantities sufficient to produce ignitable mixtures. They include the following:

(a) Class III, Division 1 locations are those where easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Such locations usually include combustible fiber manufacturing and processing plants; cotton gins and cottonseed mills; flax-processing plants; and industries involving similar hazardous processes or conditions.

Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

(b) Class III, Division 2 locations are those where easily ignitable fibers are stored or handled, except in process of manufacture.

[97-09-013, recodified as § 296-307-37206, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37206, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37209 What equipment, wiring methods, and installations may be used in hazardous locations?** Equipment, wiring methods, and installations of equipment in hazardous locations must be intrinsically safe, or approved for the hazardous location, or safe for the hazardous location. Requirements for each of these options are as follows:

(1) Equipment and associated wiring approved as intrinsically safe are permitted in any hazardous location for which it is approved.

(2) Requirements to be approved for the hazardous location:

(a) Equipment must be approved for the class of location and for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

(b) Equipment must be marked to show the class, group, and operating temperature or temperature range, based on operation in a 40 degrees C ambient, for which it is approved. The temperature marking must be a maximum of the ignition temperature of the specific gas or vapor to be encountered. The following provisions apply to specific equipment:

(i) Nonheat-producing equipment, such as junction boxes, conduit, and fittings, and heat-producing equipment with a maximum temperature of 100 degrees C (212 degrees F) need not have a marked operating temperature or temperature range.

(ii) Fixed lighting fixtures marked for use in Class I, Division 2 locations only, need not be marked to indicate the group.

(iii) Fixed general-purpose equipment in Class I locations (other than lighting fixtures) that is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(iv) Fixed dust-tight equipment (other than lighting fixtures) that is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(3) Equipment that is safe for the location shall be of a type and design that provides protection from the hazards arising from combustible and flammable vapors, liquids, gases, dusts, or fibers.

Note: Equipment that meets the requirements of The National Electrical Code, NFPA 70, shall be considered in compliance with the requirements of WAC 296-307-372.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37209, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37209, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37209, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37212 How must conduit be installed in hazardous locations?** All conduits must be threaded and wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper must be used.

[97-09-013, recodified as § 296-307-37212, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37212, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37215 Which equipment may be used in Division 1 and 2 locations?** Equipment that has been approved for a Division 1 location may be installed in a Division 2 location of the same class and group. General-purpose equipment or equipment in general-purpose enclosures may be installed in Division 2 locations if the equipment does not constitute a source of ignition under normal operating conditions.

[97-09-013, recodified as § 296-307-37215, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37215, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37218 What requirements apply to motors and generators used in hazardous locations?** In Class I, Division 1 locations, motors, generators and other rotating electric machinery must be:

(1) Approved for Class I, Division 1 locations (explosion-proof); or

(2) Of the totally enclosed type supplied with positive-pressure ventilation from a source of clean air with discharge to a safe area, arranged to prevent energizing of the machine until ventilation has been established and the enclosure has been purged with at least 10 volumes of air, and also arranged to automatically deenergize the equipment when the air supply fails; or

(3) Of the totally enclosed inert-gas-filled type supplied with a suitable reliable source of inert gas for pressuring the enclosure, with devices provided to ensure a positive pressure in the enclosure and arranged to automatically deenergize the equipment when the gas supply fails; or

(4) Of a type designed to be submerged in a liquid that is flammable only when vaporized and mixed with air, or in a gas or vapor at a pressure greater than atmospheric and which is flammable only when mixed with air; and the machine is arranged to prevent energizing it until it has been purged with the liquid or gas to exclude air, and also arranged to automatically deenergize the equipment when the supply of liquid, or gas or vapor fails or the pressure is reduced to atmospheric.

Totally enclosed type (2) and (3) motors must have no external surface with a Celsius operating temperature greater than 80% of the ignition temperature of the gas or vapor involved, as determined by ASTM test procedure (Designation: D-2155-69). Appropriate devices must be provided to detect an increase in temperature of the motor beyond design limits and automatically deenergize the equipment or provide an adequate alarm. Auxiliary equipment must be approved for the location in which it is installed.

[97-09-013, recodified as § 296-307-37218, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37218, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-374 Special systems.**

[97-09-013, recodified as § 296-307-374, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-374, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37403 What requirements apply to systems over 600 volts, nominal?** (1) Wiring methods for fixed installations over 600 volts, nominal, must meet the following requirements:

(a) Above-ground conductors must be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable suitable for the use and purpose. Open runs of nonmetallic-sheathed cable or of bare conductors or bus-bars must be installed in locations accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, must be grounded. Open runs of insulated wires and cables with a bare lead sheath or a braided outer covering must be supported to prevent physical damage to the braid or sheath.

(b) Conductors emerging from the ground must be enclosed in approved raceways.

(2) Interrupting and isolating devices must meet the following requirements:

(a) Circuit breaker installations located indoors must consist of metal-enclosed units or fire-resistant cell-mounted

units. Circuit breakers must be open mounted only in locations that are accessible only to qualified persons. A means of indicating the open and closed position of circuit breakers must be provided.

(b) Fused cutouts installed in buildings or transformer vaults must be approved for the purpose. They must be readily accessible for fuse replacement.

(c) A means must be provided to completely isolate equipment for inspection and repairs. Isolating means that are not designed to interrupt the load current of the circuit must be either interlocked with an approved circuit interrupter or provided with a sign warning against opening them under load.

(3) Mobile and portable equipment must meet the following requirements:

(a) A metallic enclosure must be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure must include provisions for a solid connection for the ground wire terminal to effectively ground the machine frame. The method of cable termination used must prevent any strain or pull on the cable from stressing the electrical connections. The enclosure must be lockable so only authorized qualified persons may open it and must be marked with a sign warning of the presence of energized parts.

(b) All energized switching and control parts must be enclosed in grounded metal cabinets or enclosures. Circuit breakers and protective equipment must have the operating means projecting through the metal cabinet or enclosure so these units can be reset without opening locked doors. Enclosures and metal cabinets must be locked so that only authorized qualified persons have access and must be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving machines (shovels, draglines, etc.) must be guarded.

(4) Tunnel installations of high-voltage power distribution and utilization equipment that is portable or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators must meet the following requirements:

(a) Conductors in tunnels must be installed in one or more of the following:

- (i) Metal conduit or other metal raceway;
- (ii) Type MC cable; or
- (iii) Other approved multiconductor cable.

Conductors must also be located or guarded to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor must be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor may be insulated or bare.

(b) Bare terminals of transformers, switches, motor controllers, and other equipment must be enclosed to prevent accidental contact with energized parts. Enclosures used in tunnels must be drip-proof, weatherproof, or submersible as required by environmental conditions.

(c) A disconnecting means that simultaneously opens all ungrounded conductors must be installed at each transformer or motor location.

(d) All nonenergized metal parts of electric equipment and metal raceways and cable sheaths must be effectively

grounded and bonded to all metal pipes and rails at the portal and at maximum intervals of 1000 feet throughout the tunnel.

[97-09-013, recodified as § 296-307-37403, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37403, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37406 What requirements apply to emergency power systems?** This section applies to circuits, systems, and equipment intended to supply power for illumination and special loads, in the event of failure of the normal supply.

(1) Emergency circuit wiring must be kept entirely independent of all other wiring and equipment and must not enter the same raceway, cable, box, or cabinet as other wiring.

Exception: This does not apply where common circuit elements suitable for the purpose are required, or for transferring power from the normal to the emergency source.

(2) Where emergency lighting is necessary, the system must be arranged so that the failure of any individual lighting element, such as a burned out light bulb, cannot leave any space in total darkness.

[97-09-013, recodified as § 296-307-37406, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37406, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37409 How are Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits classified?** (1) Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified according to their voltage and power limitations as follows.

(a) Class 1 circuits.

(i) A Class 1 power-limited circuit is supplied from a source with a maximum rated output of 30 volts and 1000 volt-amperes.

(ii) A Class 1 remote control circuit or a Class 1 signaling circuit has a maximum voltage of 600 volts; however, the power output of the source need not be limited.

(b) Class 2 and Class 3 circuits.

(i) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is required) or by a combination of a power source and overcurrent protection.

(ii) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(iii) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(c) The maximum circuit voltages in (a) and (b) of this subsection apply to sinusoidal AC or continuous DC power sources, and where wet contact is unlikely.

(2) A Class 2 or Class 3 power supply unit must be durably and visibly marked to indicate the class of supply and its electrical rating.

[97-09-013, recodified as § 296-307-37409, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37409, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37412 What requirements apply to fire protective signaling systems?** (1) Fire protective signaling circuits must be classified either as nonpower limited or power limited.

(2) The power sources for use with fire protective signaling circuits must be either power limited or nonlimited as follows:

(a) The power supply of nonpower-limited fire protective signaling circuits must have a maximum output voltage of 600 volts.

(b) The power for power-limited fire protective signaling circuits must be either inherently limited, in which no overcurrent protection is required, or limited by a combination of power source and overcurrent protection.

(3) Nonpower-limited fire protective signaling circuits and Class 1 circuits may occupy the same enclosure, cable, or raceway if all conductors are insulated for maximum voltage of any conductor within the enclosure, cable or raceway. Power supply and fire protective signaling circuit conductors are permitted in the same enclosure, cable, or raceway only if connected to the same equipment.

(4) Where open conductors are installed, power-limited fire protective signaling circuits must be separated at least 2 inches from conductors of any light, power, Class 1, and nonpower-limited fire protective signaling circuits unless using a special and equally protective method of conductor separation. Cables and conductors of two or more power-limited fire protective signaling circuits or Class 3 circuits are permitted in the same cable, enclosure, or raceway. Conductors of one or more Class 2 circuits are permitted within the same cable, enclosure, or raceway with conductors of power-limited fire protective signaling circuits if the insulation of Class 2 circuit conductors in the cable, enclosure, or raceway is at least that needed for the power-limited fire protective signaling circuits.

(5) Fire protective signaling circuits must be identified at terminal and junction locations in a manner that will prevent unintentional interference with the signaling circuit during testing and servicing. Power-limited fire protective signaling circuits must be visibly and durably marked at terminations.

[97-09-013, recodified as § 296-307-37412, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37412, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-376 Working on or near exposed energized parts.**

[97-09-013, recodified as § 296-307-376, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-376, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37603 What does this section cover?** WAC 296-307-376 applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37603, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37603, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37603, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2482]

**WAC 296-307-37606 Who may work on energized parts?** Only qualified persons may work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-307-37807. Qualified persons must be capable of working safely on energized circuits and must be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37606, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37606, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37606, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37609 What requirements apply to working near low voltage lines?** When employees are working near energized electrical service conductors operating at 750 volts or less, employees must work in a manner to prevent contact with the energized conductors.

[97-09-013, recodified as § 296-307-37609, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37609, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37612 What requirements apply to qualified persons working near overhead lines?** When a qualified person is working near overhead lines, whether in an elevated position or on the ground, the person must not approach, or take any conductive object without an approved insulating handle, closer to exposed energized parts than shown in WAC 296-307-150 unless:

(1) The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed); or

(2) The energized part is insulated both from all other conductive objects at a different potential and from the person; or

(3) The person is insulated from all conductive objects at a potential different from that of the energized part.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37612, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37612, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37612, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37615 What requirements apply to vehicles and mechanical equipment near overhead lines?**

(1) Any vehicle or mechanical equipment that may have parts of its structure elevated near energized overhead lines must be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance must be increased 0.4 inch for every 1kV over the voltage. The clearance may be reduced only if:

(a) The vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance must be increased 0.4 inch for every 1kV over that voltage.

(b) Insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be

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reduced to a distance within the designed working dimensions of the insulating barrier.

(2) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in WAC 296-307-150.

(3) Employees standing on the ground must not contact the vehicle or mechanical equipment or any of its attachments, unless:

(a) The employee is using protective equipment rated for the voltage; or

(b) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

(4) If any vehicle or mechanical equipment that may have parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding must not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, must be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37615, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37615, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37615, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37618 What lighting must be provided for employees working near exposed energized parts?** (1) Employees must not enter spaces containing exposed energized parts, unless lighting is provided that enables the employees to perform the work safely.

(2) Where lack of lighting or an obstruction prevents an employee from seeing the work to be performed, employees must not perform tasks near exposed energized parts. Employees shall not reach blindly into areas that may contain energized parts.

[97-09-013, recodified as § 296-307-37618, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37618, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37621 What requirements apply to working near exposed energized parts in confined spaces?**

(1) For working in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee must use, protective shields, protective barriers, or insulating materials that are necessary to avoid contact with these parts. Doors, hinged panels, and the like must be secured to prevent swinging into an employee and causing the employee to contact exposed energized parts.

(2) Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee handles long conductive objects (such as ducts and pipes) in areas with

exposed live parts, you must institute work practices (such as the use of insulation, guarding, and material handling techniques) that will minimize the hazard.

(3) Portable ladders must have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(4) Conductive articles of jewelry and clothing shall not be worn if they might contact exposed energized parts.

[97-09-013, recodified as § 296-307-37621, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37621, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37624 What housekeeping requirements apply to working near exposed energized parts?** (1)

Where live parts present an electrical contact hazard, employees must not perform housekeeping duties near enough to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

(2) Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) must not be used in proximity to energized parts unless procedures are followed that will prevent electrical contact.

[97-09-013, recodified as § 296-307-37624, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37624, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37627 Who may defeat an electrical safety interlock?** Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system must be returned to its operable condition when this work is completed.

[97-09-013, recodified as § 296-307-37627, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37627, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-378 Safety-related work practices.**

[97-09-013, recodified as § 296-307-378, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-378, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37801 What does this section cover?**

(1) WAC 296-307-376 and 296-307-378 cover electrical safety-related work practices for both qualified persons (those who have training in avoiding the electrical hazards of working on or near exposed energized parts) and unqualified persons (those with little or no such training) working on, near, or with the following installations:

(a) Installations of electric conductors and equipment within or on buildings or other structures, and on other premises such as yards, parking, and other lots, and industrial substations;

(b) Installations of conductors that connect to the supply of electricity;

(c) Installations of other outside conductors on the premises; and

(d) Installations of optical fiber cable where such installations are made along with electric conductors.

(2) WAC 296-307-367 and 296-307-378 cover work performed by unqualified persons on, near, or with the installations listed in subsection (3) of this section.

(3) WAC 296-307-376 and 296-307-378 do not apply to work performed by qualified persons on or directly associated with the following installations:

(a) Installations for the generation, control, transformation, transmission, and distribution of electric energy (including communication and metering) located in buildings used for such purposes or located outdoors.

Work on or directly associated with generation, transmission, or distribution installations includes:

(i) Work performed directly on installations, such as repairing distribution lines or repairing a feed-water pump for the boiler in a generating plant.

(ii) Work directly associated with installations, such as line-clearance tree trimming and replacing utility poles.

(iii) Work on electric utilization circuits in a generating plant where:

- The circuits are combined with installations of power generation equipment or circuits; and
- The generation equipment or circuits present greater electrical hazards than those posed by the utilization equipment or circuits (such as exposure to higher voltages or lack of overcurrent protection).

(b) Installations in watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles.

(c) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations of railways used exclusively for signaling and communication purposes.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37801, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37801, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37801, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37803 How must employees be trained on safety practices?** (1) The training requirements in this section apply to employees who face a risk of electrical shock that is not reduced to a safe level by the electrical installation requirements of WAC 296-307-362 through 296-307-374.

(2) Training contents must include the following:

(a) Employees must be trained in and familiar with the safety-related work practices required by WAC 296-307-376 through 296-307-378 that apply to their job assignments.

(b) Employees who are covered by this section but who are not qualified persons must also be trained in and familiar with any electrically related safety practices that are not covered by this standard, but that are necessary for their safety.

(c) Qualified persons must, at a minimum, be trained in and familiar with the following:

(i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment;

(ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts; and

(iii) The clearance distance specified in WAC 296-307-376 and the corresponding voltages to which the qualified person will be exposed.

[Title 296 WAC—p. 2484]

Note 1: For the purposes of WAC 296-307-376 and 296-307-378, an employee must have the training required for a qualified person in order to be considered a qualified person.

Note 2: Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials must also have the training needed to meet WAC 296-307-376.

(3) You must provide either classroom or on-the-job training. The degree of training provided must be determined by the risk to the employee.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37803, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37803, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37803, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37805 How must safety-related work practices be chosen and used?** Safety-related work practices must be used to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits that are or may be energized. The specific safety-related work practices must be consistent with the nature and extent of the associated electrical hazards.

(1) When an employee may be exposed to live parts, they must be deenergized before the employee works on or near them, unless deenergizing introduces other hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Note 1: Examples of other hazards include deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.

Note 2: An example of work that may be performed on or near energized circuit parts because of unfeasibility due to equipment design or operational limitations is testing of electric circuits that can only be performed with the circuit energized.

(2) If the exposed live parts are not deenergized (for reasons of increased or additional hazards or unfeasibility), other safety-related work practices must be used to protect employees who may be exposed to the electrical hazards involved. Such work practices must protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices must be suitable for the voltage level of the exposed electric conductors or circuit parts.

[97-09-013, recodified as § 296-307-37805, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37805, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37807 What work practices must be followed for work on exposed deenergized parts?** (1) This section applies to work on exposed deenergized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been deenergized but have not been locked out or tagged must be treated as energized parts, and WAC 296-307-376 applies to work on or near them.

(2) While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts must be locked out or tagged or both according to the requirements of this sec-

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tion. The requirements must be followed in the order in which they are presented.

"Fixed equipment" means equipment that is fastened or connected by permanent wiring methods.

Note: Lockout and tagging procedures that comply with WAC 296-307-320 will also be deemed to comply with WAC 296-307-37807 through 296-307-37817 if:

- The procedures address the electrical safety hazards covered by this part; and
- The procedures include the requirements of WAC 296-307-37813(4) and 296-307-37815(2).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37807, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37807, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37807, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37809 Must an employer have a written copy of lockout-tagout procedures?** The employer must maintain a written copy of the procedures outlined in WAC 296-307-37807 through 296-307-37817 and must make it available for inspection by us or by employees. The written procedures may be in the form of a copy of WAC 296-307-37807 through 296-307-37817.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37809, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37809, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37809, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37811 What work practices must be followed for deenergizing equipment?** (1) Safe procedures for deenergizing circuits and equipment must be determined before circuits or equipment are deenergized.

(2) The circuits and equipment to be worked on must be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, must not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment must not be used as a substitute for lockout and tagging procedures.

(3) Stored electric energy which might endanger employees must be released. Capacitors must be discharged and high capacitance elements must be short-circuited and grounded, if the stored electric energy might endanger employees.

Note: Capacitors or associated equipment handled in meeting this requirement must be treated as energized.

(4) Stored nonelectrical energy in devices that could reenergize electric circuit parts must be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

[97-09-013, recodified as § 296-307-37811, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37811, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37813 How must locks and tags be applied?** (1) A lock and a tag must be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in subsections (3) and (5) of this section. The lock must be attached to prevent anyone from operating the disconnecting means unless they resort to undue force or the use of tools.

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(2) Each tag must have a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(3) If a lock cannot be applied, or if tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(4) A tag used without a lock must be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(5) A lock may be placed without a tag only under the following conditions:

(a) Only one circuit or piece of equipment is deenergized; and

(b) The lockout period does not extend beyond the work shifts; and

(c) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

[97-09-013, recodified as § 296-307-37813, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37813, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37815 What work practices must be followed to verify deenergization?** The requirements of this section must be met before any circuits or equipment can be considered and worked as deenergized.

(1) A qualified person must operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(2) A qualified person must use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test must also determine if any energized conditions exist as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment must be checked for proper operation immediately before and immediately after this test.

[97-09-013, recodified as § 296-307-37815, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37815, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37817 What work practices must be followed when reenergizing equipment?** These requirements must be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(1) A qualified person must conduct tests and visual inspections as necessary to verify that all tools, electrical jumpers, shorts, grounds, and other devices have been removed, so that the circuits and equipment can be safely energized.

(2) Employees exposed to the hazards associated with reenergizing the circuit or equipment must be warned to stay clear of circuits and equipment.

(3) Each lock and tag must be removed by the employee who applied it or under his or her direct supervision. How-

ever, if this employee is absent from the workplace, then the lock or tag must be removed by a qualified person designated to perform this task if:

(a) The employer ensures that the employee who applied the lock or tag is not available at the workplace; and

(b) The employer ensures that the employee is aware that the lock or tag has been removed before resuming work at that workplace.

(4) There shall be a visual determination that all employees are clear of the circuits and equipment.

[97-09-013, recodified as § 296-307-37817, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37817, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37819 What safety-related work practices relate to portable electric equipment?** This section applies to using cord-connected and plug-connected equipment, including flexible cord sets (extension cords).

(1) Portable equipment must be handled in a manner that will not cause damage. Flexible electric cords connected to equipment must not be used for raising or lowering the equipment. Flexible cords must not be fastened with staples or otherwise hung in a way that could damage the outer jacket or insulation.

(2) Visual inspection requirements:

(a) Portable cord-connected and plug-connected equipment and flexible cord sets must be visually inspected before use on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jackets or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord-connected and plug-connected equipment and flexible cord sets that remain connected once they are in place and are not exposed to damage need not be visually inspected until they are relocated.

(b) If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged items must be removed from service, and no employee shall use it until repairs and tests necessary to render the equipment safe have been made.

(c) When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts must first be checked to ensure they are of proper mating configurations.

(3) Requirements for grounding-type equipment:

(a) A flexible cord used with grounding-type equipment must contain an equipment grounding conductor.

(b) Attachment plugs and receptacles must not be connected or altered in a manner that would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. These devices must not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.

(c) Adapters that interrupt the continuity of the equipment grounding connection are prohibited.

(4) Portable electric equipment and flexible cords used in highly conductive work locations, or in locations where employees are likely to contact water or conductive liquids, must be approved for those locations.

(5) Connecting attachment plugs.

(a) Employees' hands must not be wet when plugging and unplugging flexible cords and cord-connected and plug-connected equipment, if energized equipment is involved.

(b) Energized plug and receptacle connections must be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand. For example: If a cord connector is wet from being immersed in water.

(c) Locking-type connectors must be properly secured after connection.

[97-09-013, recodified as § 296-307-37819, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37819, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37821 What safety-related work practices relate to electric power and lighting circuits?** (1)

Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means must be used for the opening, reversing, or closing of circuits under load conditions. Any cable connectors other than the load-break type, fuses, terminal lugs, and cable splice connections are prohibited for such purposes, except in an emergency.

(2) After a circuit is deenergized by a circuit protective device, the circuit must not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. This repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault connection, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

(3) Overcurrent protection of circuits and conductors must not be modified, even on a temporary basis, beyond that allowed by this part for the installation safety requirements for overcurrent protection.

[97-09-013, recodified as § 296-307-37821, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37821, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37823 What safety-related work practices relate to test instruments and equipment?** (1) Only qualified persons may perform testing work on electric circuits or equipment.

(2) Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors must be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item must be removed from service, and no employee may use it until necessary repairs and tests to render the equipment safe have been made.

(3) Test instruments and equipment and their accessories must be rated for the circuits and equipment to which they will be connected and must be designed for the environment in which they will be used.

[97-09-013, recodified as § 296-307-37823, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37823, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-37825 What safety-related work practices relate to flammable materials?** Where flammable materials are present only occasionally, electric equipment capable of igniting them must not be used, unless measures are taken to prevent hazardous conditions from developing.

Such materials include, but are not limited to: Flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

Note: Electrical installation requirements for locations where flammable materials are present on a regular basis are contained in WAC 296-307-372.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37825, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-37825, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37825, filed 10/31/96, effective 12/1/96.]

### **WAC 296-307-380 Electrical protective equipment.**

[97-09-013, recodified as § 296-307-380, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-380, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-38003 How must protective equipment be used?** (1) Employees working in the areas where there are potential electrical hazards must have and use electrical protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed.

(2) If the insulating capability of protective equipment may be subject to damage during use, the insulating material must be protected.

For example: An outer covering of leather is sometimes used to protect rubber insulating material.

(3) Employees must wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with exposed energized parts.

(4) Employees must wear protective equipment for the eyes or face wherever there is danger of injury to the eyes or face from electrical arcs or flashes or from flying objects resulting from electrical explosion.

[97-09-013, recodified as § 296-307-38003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-38003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-38006 What requirements apply to general protective equipment and tools?** (1) When working near exposed energized conductors or circuit parts, each employee must use insulated tools or handling equipment if the tools or handling equipment might make contact with such conductors or parts. If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material must be protected.

(2) Ropes and handlines used near exposed energized parts must be nonconductive.

(3) Protective shields, protective barriers, or insulating materials must be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near exposed energized parts that might

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be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they must be guarded to protect unqualified persons from contact with the live parts.

(4) Altering techniques must be used to warn and protect employees from hazards that could cause injury due to electrical shock, burns, or failure of electric equipment parts.

(5) Safety signs, safety symbols, or accident prevention tags must be used where necessary to warn employees about electrical hazards that may endanger them, as required by WAC 296-307-330.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-38006, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-38006, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-38006, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-38009 What manufacturing and marking requirements apply to electrical protective devices?** Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following manufacture and marking requirements:

(1) Blankets, gloves, and sleeves must be produced by a seamless process.

(2) Each item must be clearly marked as follows:

(a) All classified equipment must be marked with its class number.

(b) Nonozone-resistant equipment other than matting must be marked Type I.

(c) Ozone-resistant equipment other than matting must be marked Type II.

(d) Other relevant markings, such as the manufacturer's identification and the size of the equipment, may also be provided.

(3) Markings must be nonconducting and shall be applied so they do not impair the insulating qualities of the equipment.

(4) Markings on gloves must be on the cuff.

[97-09-013, recodified as § 296-307-38009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-38009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-38012 What electrical requirements apply to electrical protective devices?** Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following electrical requirements:

(1) Equipment must be capable of withstanding the a-c proof-test voltage specified in Table 1 or the d-c proof-test voltage specified in Table 2.

(a) The proof-test must reliably indicate that the equipment can withstand the voltage involved.

(b) The test voltage must be applied continuously for three minutes for equipment other than matting and must be applied continuously for one minute for matting.

(c) Gloves must also be capable of withstanding the a-c proof-test voltage specified in Table 1 after a sixteen-hour water soak.

(2) When the a-c proof-test is used on gloves, the 60 hertz proof-test current must not exceed the values specified in Table 1 at any time during the test period.

(a) If the a-c proof-test is made at a frequency other than 60 hertz, the permissible proof-test current must be computed from the direct ratio of the frequencies.

(b) For the test, gloves (right side out) must be filled with tap water and immersed in water to a depth that is in accordance with Table 3. Water must be added to or removed from the glove, as necessary, so that the water level is the same inside and outside the glove.

(c) After the sixteen-hour water soak, the 60 hertz proof-test current may exceed the values given in Table 1 by not more than 2 milliamperes.

(3) Equipment that has been subjected to a minimum breakdown voltage test must not be used for electrical protection.

(4) Material used for Type II insulating equipment must be capable of withstanding an ozone test, with no visible effects. The ozone test must reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material.

Note: Rubber insulating equipment meeting the following national consensus standards is considered to be in compliance with WAC 296-307-38009, 296-307-38012, and 296-307-38015:

- American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.
- ASTM D 178-93, Specification for Rubber Insulating Matting.
- ASTM D 1048-93, Specification for Rubber Insulating Blankets.
- ASTM D 1049-93, Specification for Rubber Insulating Covers.
- ASTM D 1050-90, Specification for Rubber Insulating Line Hose.
- ASTM D 1051-87, Specification for Rubber Insulating Sleeves.

These standards contain specifications for conducting the tests required in this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-38012, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-38012, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-38012, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-38015 What workmanship and finish requirements apply to electrical protective devices?** Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following workmanship and finish requirements:

(1) Equipment must be free of harmful physical irregularities that can be detected by the tests or inspections required in WAC 296-307-38012.

(2) Surface irregularities that may be present on all rubber goods because of imperfections on forms or molds or because of inherent difficulties in the manufacturing process and that may appear as indentations, protuberances, or imbedded foreign material are acceptable if:

(a) The indentation or protuberance blends into a smooth slope when the material is stretched.

(b) Foreign material remains in place when the insulating material is folded and stretches with the insulating material surrounding it.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-38015, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-38015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060, 96-22-048, § 296-306A-38015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-38018 How must electrical protective devices be maintained and used?** (1) Electrical protective equipment must be maintained in a safe, reliable condition.

(2) The following specific requirements apply to insulating blankets, covers, line hose, gloves, and sleeves made of rubber:

(a) Maximum use voltages must meet the requirements in Table 4.

(b) Insulating equipment must be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves must be given an air test, along with the inspection.

(c) Insulating equipment with any of the following defects must not be used:

(i) A hole, tear, puncture, or cut;

(ii) Ozone cutting or ozone checking (the cutting action produced by ozone on rubber under mechanical stress into a series of interlacing cracks);

(iii) An embedded foreign object;

(iv) Any of the following texture changes: Swelling, softening, hardening, or becoming sticky or inelastic;

(v) Any other defect that damages the insulating properties.

(d) Insulating equipment found to have other defects that might affect its insulating properties must be removed from service and returned for testing under (h) of this subsection.

(e) Insulating equipment must be cleaned as needed to remove foreign substances.

(f) Insulating equipment must be stored in such a location and in such a manner as to protect it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions.

(g) Protector gloves must be worn over insulating gloves.

(h) Electrical protective equipment must be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests must be according to Table 4 and Table 5.

(i) The test method used must reliably indicate whether the insulating equipment can withstand the voltages involved.

Note: Standard electrical test methods considered as meeting this requirement are given in the following national consensus standards:

- American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.
- ASTM D 1048-93, Specification for Rubber Insulating Blankets.
- ASTM D 1049-93, Specification for Rubber Insulating Covers.
- ASTM D 1050-90, Specification for Rubber Insulating Line Hose.
- ASTM D 1051-87, Specification for Rubber Insulating Sleeves.
- ASTM F 478-92, Specification for In-Service Care of Insulating Line Hose and Covers.
- ASTM F 479-88a, Specification for In-Service Care of Insulating Blankets.
- ASTM F 496-93b, Specification for In-Service Care of Insulating Gloves and Sleeves.

(j) Insulating equipment that fails inspections or electrical tests must not be used by employees, except as follows:

(i) Rubber insulating line hose could be used in shorter lengths with the defective portion cut off.

(ii) Rubber insulating blankets could be repaired using a compatible patch that results in physical and electrical properties equal to those of the blanket.

(iii) Rubber insulating blankets could be salvaged by severing the defective area from the undamaged portion of the blanket. The resulting undamaged area must not be

smaller than twenty-two inches by twenty-two inches (560 mm by 560 mm) for Class 1, 2, 3, and 4 blankets.

(k) Repaired insulating equipment must be retested before it may be used by employees.

(l) You must certify that equipment has been tested in accordance with the requirements of (h), (i), and (k) of this subsection. The certification must identify the equipment that passed the test and the date it was tested.

Note: This requirement may be met by marking the equipment and entering the results of the tests and the dates of testing onto logs.

Class of equipment	Proof-test voltage rms V	267 mm (10.5 in.) glove	356 mm (14 in.) glove	406 mm (16 in.) glove	457 mm (18 in.) glove
0	5,000	8	12	14	16
1	10,000		14	16	18
2	20,000		16	18	20
3	30,000		18	20	22
4	40,000			22	24

Class of Equipment	Proof-test voltage
0	20,000
1	40,000
2	50,000
3	60,000
4	70,000

Note: The d-c voltages listed in this table are not appropriate for proof testing rubber insulating line hose or covers. For this equipment, d-c proof-tests shall use a voltage high enough to indicate that the equipment can be safely used at the voltages listed in Table 3. See ASTM D 1050-90 and ASTM D 1049-88 for further information on proof tests for rubber insulating line hose and covers.

Class of glove	A-C proof-test		D-C proof-test	
	mm.	in.	mm.	in.
0	38	1.5	38	1.5
1	38	1.5	51	2.0
2	64	2.5	76	3.0
3	89	3.5	102	4.0
4	127	5.0	153	6.0

<sup>1</sup>The water level is given as the clearance from the cuff of the glove to the water line, with a tolerance of 13 mm. (0.5 in.).

<sup>2</sup>If atmospheric conditions make the specified clearances impractical, the clearances may be increased by a maximum of 25 mm. (1 in.).

Class of equipment	Maximum use voltage <sup>1</sup> a-c-rms	Retest voltage <sup>2</sup> a-c-rms	Retest voltage <sup>2</sup> d-c-rms
0	1,000	5,000	20,000
1	7,500	10,000	40,000
2	17,000	20,000	50,000
3	26,500	30,000	60,000
4	36,000	40,000	70,000

Note: Rubber gloves shall only be used on voltages of 5000 volts phase to phase or less.

The maximum use voltage is the a-c voltage (rms) classification of the protective equipment that designates the maximum nominal design/voltage of the energized system that may be safely worked. The nominal voltage design is equal to the phase-to-phase voltage on multiphase circuits. However, the phase-to-ground potential is considered to be the nominal design/voltage:

(a) If there is no multiphase exposure in a system area and if the voltage exposure is limited to the phase-to-ground potential, or

(b) If the electrical equipment and devices are insulated or isolated or both so that the multiphase exposure on a grounded wye circuit is removed.

<sup>2</sup>The proof-test voltage shall be applied continuously for at least one minute, but no more than three minutes.

<b>Table 5 Rubber Insulating Equipment Test Intervals</b>	
Type of equipment	When to test
Rubber insulating line hose	Upon indication that insulating value is suspect
Rubber insulating covers	Upon indication that insulating value is suspect
Rubber insulating blankets	Before first issue and every 12 months thereafter
Rubber insulating gloves	Before first issue and every 6 months thereafter
Rubber insulating sleeves	Before first issue and every 12 months thereafter

(3) Where switches or fuses of more than 150 volts to ground are not guarded during ordinary operations, suitable insulating floors, mats or platforms must be provided on which the operator must stand while handling the switches.

[97-09-013, recodified as § 296-307-38018, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-38018, filed 10/31/96, effective 12/1/96.]

[97-09-013, recodified as § 296-307-40003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40003, filed 10/31/96, effective 12/1/96.]

**SPECIALIZED OPERATIONS**

**Part U-1**

**Hazardous Materials—Anhydrous Ammonia**

**WAC 296-307-400 Anhydrous ammonia.**

[97-09-013, recodified as § 296-307-400, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-400, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40001 What does this section cover?**

WAC 296-307-400 covers the transportation and application of anhydrous ammonia.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40003 What definitions apply to this section?** "Certified" means the equipment has been tested by a nationally recognized testing laboratory and meets nationally recognized standards or is safe for a specific use; or is a kind whose production is periodically inspected by a nationally recognized testing laboratory, and bears identification of certification.

"DOT" means the Federal Department of Transportation.

"DOT container" means a container constructed according to the requirements of 49 CFR chapter 1.

"DOT cylinder" means a cylinder that meets the requirements of 49 CFR chapter I.

"Labeled" means the equipment has an attached label, symbol, or other identifying mark of a nationally recognized testing laboratory that makes periodic inspections of the production of such equipment, and the label indicates compliance with nationally recognized standards or tests.

**WAC 296-307-40005 What general requirements apply to the storage and handling of anhydrous ammonia?** (1) All employees must use at least gloves and goggles and may supplement with a face shield while working on or with changed anhydrous ammonia equipment.

(2) You must ensure that equipment is inspected before each day's work. Conditions that would contribute to leaks shall be corrected.

(3) Hose end-valves must be closed when not in use to prevent accidental discharge in case the main valve is opened.

(4) Relief and vapor valves must discharge away from the operator's working position.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40007 What requirements apply to systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia?** All anhydrous ammonia containers with a capacity of 3,000 gallons or less and equipment mounted on farm wagons (implements of husbandry) that is used to transport ammonia must meet the requirements of this section.

WAC 296-307-40011 through 296-307-40037 also apply unless otherwise noted.

(1) Containers must meet the following mounting requirements:

(a) The farm wagon or container has a stop so the container does not dislodge from its mounting when a farm wagon stops suddenly.

(b) The container is anchored to the farm wagon at one or more places on each side of the container.

(c) The weight of containers mounted on four-wheel farm wagons, is distributed evenly over both axles.

(d) When the cradle and the container are not welded together, material between them eliminates metal-to-metal friction.

(2) Container accessories must meet the following requirements:

(a) Each container has a fixed maximum liquid-level gauge.

(b) All containers with more than 250-gallon capacity have a pressure gauge with a dial graduated from 0-400 psi.

(c) The filling connection is fitted with one of the following:

(i) A combination back-pressure check valve and excess-flow valve; or

(ii) One double or two single back-pressure check valves; or

(iii) A positive shut-off valve that has either an internal back-pressure check valve or an internal excess flow valve.

(d) All containers with more than 250-gallon capacity are equipped for spray loading or with an approved vapor return valve.

(e) All vapor and liquid connections have approved excess flow valves or quick-closing internal valves that are only open for operating.

Exception: Safety-relief valves and connections that are specifically exempted by WAC 296-307-40019(5) are exempt from this requirement.

(f) Fittings are protected from physical damage by a rigid guard. The guard is designed to withstand force from any direction, equal to twice the weight of the container and loading, at a safety factor of four. If the guard is fully enclosed, the safety-relief valves are properly vented through the guard.

(g) If a liquid withdrawal line is installed in the bottom of a container, the connections and hose are at least as high as the lowest horizontal edge of the farm wagon axle.

(h) Both ends of the hose are secure while in transit.

(3) Each side and the rear end of the container must be marked in letters at least four inches high, with the words "ANHYDROUS AMMONIA" or, "CAUTION—AMMONIA," or marked according to DOT regulations.

(4) Farm wagons (implements of husbandry) must meet all state regulations and the following requirements:

(a) All farm wagons must be securely attached to the vehicle drawing them by drawbars with safety chains.

(b) A farm wagon must be constructed so that it will follow the path of the towing vehicle and will prevent the towed wagon from whipping or swerving dangerously from side to side.

(c) All farm wagons must have five gallons or more of readily available clean water.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40007, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40009 What requirements apply to systems mounted on farm wagons (implements of husbandry) for the application of ammonia?** This section applies to systems mounted on farm equipment that are used for the field application of ammonia.

WAC 296-307-40011 through 296-307-40037 also apply unless otherwise noted.

(1) All containers must be securely mounted.

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(2) Container valves and accessories must meet the following requirements:

(a) Each container has a fixed maximum liquid-level gauge.

(b) The filling connection is fitted with one of the following:

(i) A combination back-pressure check valve and excess-flow valve; or

(ii) One double or two single back-pressure check valves; or

(iii) A positive shut-off valve that has either an internal back-pressure check valve or an internal excess flow valve.

(c) An excess-flow valve is not required in the vapor connection if the controlling orifice is a maximum of 7/16 inch in diameter and the valve is a hand-operated shut-off valve. To assist in filling applicator tanks, you may bleed vapors to the open air, if this requirement is met.

(d) Metering devices may be connected directly to the tank withdrawal valve. You may use a union type connection between the tank valve and metering device. You may use remote mounting of metering devices if the hose meets the requirements of Appendix B. When the applicator tank is trailed and the metering device is remotely mounted, such as on the tractor tool bar, you must use an automatic break-away type, self-closing coupling.

(e) No excess-flow valve is required in the liquid withdrawal line if the controlling orifice between the contents of the container and the outlet of the shut-off valve is a maximum of 7/16 inch in diameter.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40011 What requirements must approved anhydrous ammonia equipment meet?** All equipment must be approved by one of the following methods:

(1) The equipment was installed before February 8, 1973, and was approved and tested, and installed according to either the requirements of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage and Handling of Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(2) The equipment is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(3)(a) The equipment is a type that no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe; and

(b) The equipment is inspected or tested by an authority responsible for enforcing occupational safety provisions of a law, code, or regulation pertaining to the storage, handling, transport, and use of anhydrous ammonia; and

(c) The equipment is found in compliance with either the requirements of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage and Handling of

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Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(4) For a custom-designed and custom-built unit:

(a) You cannot find a nationally recognized testing laboratory or authority responsible for the enforcement of a law, code or regulation pertaining to the storage, transportation and use of anhydrous ammonia that is willing to accept, certify, list, label or determine to be safe your custom equipment; and

(b) You have on file a document attesting to its safe condition following appropriate tests. The document must be signed by a registered professional engineer or qualified person. The document must describe the test bases, test data and results, and also the qualifications of the certifying person.

[97-09-013, recodified as § 296-307-40011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40013 What requirements apply to the construction, original test, and requalification of non-refrigerated containers?** The code is the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers (Section VIII of the ASME Boiler Construction Code), 1952, 1956, 1959, 1962, 1965, 1968 and 1971 editions, the joint code of the American Petroleum Institute and the American Society of Mechanical Engineers (API-ASME Code) 1951 edition, and amendments or later editions, as adopted.

(1) Containers used with systems covered in WAC 296-307-40005 and 296-307-40007 must be constructed and tested according to the code.

**Exception:** Construction under Table UW-12 at a basic joint efficiency of under 80% is prohibited. Containers built according to code are exempt from paragraphs UG-125 to UG-128, inclusive, and paragraphs UG-132 and UG-133 of the code.

**Note:** This subsection allows the continued use or reinstallation of containers constructed and maintained according to the 1949, 1950, 1952, 1956, 1959, 1962, 1965 and 1968 editions of the Unfired Pressure Vessel Code of the ASME or any revisions thereof in effect at the time of fabrication.

(2) Containers more than 36 inches in diameter or 250 gallons water capacity must be constructed to meet one or more of the following requirements:

(a) Containers must be stress relieved after fabrication according to the code; or

(b) Cold-formed heads, when used, must be stress relieved; or

(c) Hot-formed heads must be used.

(3) Welding to the shell, head, or any other part of the container subject to internal pressure must be according to the code. Other welding is permitted only on saddle plates, lugs, or brackets attached to the container by the container manufacturer.

Containers used with systems covered in subsection (4) of this section must be constructed and tested in accordance with the DOT specifications.

(4) Containers must comply with department of transportation specifications and must be maintained, filed, packaged, marked, labeled and shipped to comply with current DOT regulations and American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954 R1970. See Appendix C for availability.

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[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-40013, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40013, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40015 How must nonrefrigerated containers and systems (other than DOT containers) be marked?** (1) System nameplates, when required, must be permanently attached to the system so they are readily accessible for inspection.

(2) Each container or system covered in WAC 296-307-40005 and 296-307-40007 must be marked as follows:

(a) With indication that the container or system meets the requirements of the code under which the container is constructed.

(b) With indication on the container and system nameplate when the system is designed for underground installation.

(c) With the name and address of the supplier of the container or the trade name of the container and with the date of fabrication.

(d) With the water capacity of the container in pounds at 60°F or gallons, United States standard.

(e) With the design pressure in pounds per square inch gauge.

(f) With the wall thickness of the shell and heads.

(g) With indication of the maximum fill level for liquid anhydrous ammonia between 20°F and 100°F. Markings must be in increments of not more than 20°F.

**Exception:** Containers with fixed maximum level indicators, such as fixed length dip tubes, or containers that are filled by weight are exempt from this requirement.

(h) With the outside surface area in square feet.

(i) With minimum temperature in Fahrenheit for which the container is designed.

(j) The marking must be on the container itself or on a permanently attached nameplate.

(3) All main operating valves on permanently installed containers with a capacity of over 3,000 water gallons must be identified to show whether the valve is in liquid or vapor service. The valve must be identified as follows:

(a) The word LIQUID (or LIQUID VALVE), VAPOR (or VAPOR VALVE), as appropriate, must be placed on or within twelve inches of the valve by means of a stencil tag or decal.

(b) Liquid valves must be painted orange and vapor valves must be painted yellow. The legend ORANGE-LIQUID, YELLOW-VAPOR must be displayed in one or more conspicuous places at each permanent storage location. The legend must have letters at least two inches high and must be placed against a contrasting background.

(4) "Marking refrigerated containers." Each refrigerated container must be marked with a name plate on the outer covering in an accessible place as specified in the following:

- With the notation, "Anhydrous Ammonia"

- With the name and address of the builder and the date of fabrication

- With the water capacity of the container in gallons, U.S. Standard

- With the design pressure

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- With the minimum temperature in degrees Fahrenheit for which the container was designed
- The maximum allowable water level to which the container may be filled for test purposes
- With the density of the product in pounds per cubic foot for which the container was designed
- With the maximum level to which the container may be filled with liquid anhydrous ammonia.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-40015, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40015, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40017 Where may anhydrous ammonia containers be located?** (1) When selecting the location for a storage container, you must take into account the physiological effects of ammonia and adjacent fire hazards. Containers located indoors must be in areas especially approved for container storage.

(2) Containers must be located at least fifty feet from a dug well or other sources of potable water supply, unless the container is a part of a water treatment installation.

(3) Permanent storage containers must be located outside densely populated areas.

(4) Containers must be located according to the following:

Minimum distances (feet) from container to:

Nominal capacity of container	Line of adjoining property that may be built upon, highways & main line of railroad	Place of public assembly	Institution occupancy
Over 500 to 2,000	25	150	250
Over 2,000 to 30,000	50	300	500
Over 30,000 to 100,000	50	450	750
Over 100,000	50	600	1,000

(5) Storage areas must be kept free of readily ignitable materials such as waste, weeds and long dry grass.

[97-09-013, recodified as § 296-307-40017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40019 What requirements apply to container accessories?** (1) All accessories must be designed for at least the maximum working pressure of the part of the system on which they are installed. All accessories must be fabricated from materials suitable for anhydrous ammonia service.

(2) All connections to containers must have shut-off valves located as close to the container as practical.

Exception: Safety-relief devices, gauging devices, or those fitted with a No. 54 drill size orifice are exempt from this requirement.

(3) All required excess flow valves must close automatically at the rated flows of vapor or liquid specified by the manufacturer. The connections, lines, valves, and fittings must have a greater capacity than the rated flow of the excess flow valve.

(4) Liquid-level gauging devices that require bleeding to the atmosphere and that are constructed so that outward flow is a maximum of that passed by a No. 54 drill size opening may be installed without excess flow valves.

(5) Openings from the container or through fittings attached directly on container to which pressure gauge connections are made may be installed without excess flow valves if the openings are a maximum of No. 54 drill size.

(6) Required excess flow and back pressure check valves must be located inside the container or outside as close as practical to where the line enters the container. When located outside, the installation must be made to prevent any stress beyond the excess flow or back pressure check valve from causing a break between the container and the valve.

(7) Excess flow valves must be designed with a bypass that is a maximum of No. 60 drill size opening to allow equalization of pressures.

(8) Shut-off valves provided with an excess flow valve must be designed for proper installation in a container connection so that the excess flow valve will close if the shut-off valve breaks.

(9) All excess flow valves must be plainly and permanently marked with the name or trademark of the manufacturer, the catalog number, and the rated capacity.

[97-09-013, recodified as § 296-307-40019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40019, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40021 What requirements apply to piping, tubing, and fittings?** (1) All piping, tubing and fittings must be made of material suitable for anhydrous ammonia service.

(2) All piping, tubing and fittings must be designed for a pressure of at least the maximum pressure to which they may be subjected in service.

(3) All piping must be well supported and allow for expansion and contraction. All refrigeration system piping must conform to the Refrigeration Piping Code (ANSI B31.5 1966 addenda B31.1a-1968), a section of the American Standard Code for Pressure Piping, as it applies to ammonia.

(4) Piping used on nonrefrigerated systems must meet the requirements of ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe. Pipe must be at least Schedule 40 when joints are welded, or welded and flanged. Pipe must be at least Schedule 80 when joints are threaded. Brass, copper, or galvanized steel pipe or tubing is prohibited.

(5) All metal flexible connections for permanent installations must have a minimum working pressure of 250 psig (safety factor of 4). For temporary installations, you may use hose that meets the requirements of WAC 296-307-40023.

(6) Cast iron fittings are prohibited. You must use fittings made especially for ammonia service of malleable or nodular iron that meet the requirements of Specification ASTM A47 or ASTM A395.

(7) All piping, tubing, and fittings must allow for expansion, contraction, jarring, vibration, and settling.

(8) You must make adequate provision to protect all exposed piping from physical damage from moving machinery, the presence of automobiles or trucks, or other strain on the piping.

(9) Joint compounds must be resistant to ammonia.

(10) After assembly, all piping and tubing must be tested and proved to be free from leaks at pressure that is at least equal to the normal operating pressure of the system.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40021, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40023 What specifications must hoses meet?** (1) Hose used in ammonia service and subject to container pressure must meet the requirements of the joint Rubber Manufacturers Association and the Fertilizer Institute "Hose Specifications for Anhydrous Ammonia."

(2) Hose subject to container pressure must be designed for a minimum working pressure of 350 psig and a minimum burst pressure of 1750 psig. Hose assemblies must be able to withstand a test pressure of 500 psig.

(3) Hose and hose connections on the low pressure side of flow control or pressure reducing valves on devices discharging to atmospheric pressure must be designed for the maximum low side working pressure. All connections must be designed, constructed, and installed to prevent leaks when connected.

(4) Where liquid transfer hose is not drained after transfer operations, the hose must have an approved shut-off valve at the discharge end. You must provide a method to prevent excessive hydrostatic pressure in the hose. (See WAC 296-307-40025.)

(5) On all hose 1/2-inch outside diameter and larger, used for the transfer of anhydrous ammonia liquid or vapor, you must ensure that the following information is etched, cast, or impressed at five-foot intervals:

- Anhydrous Ammonia
- xxx psig (Maximum working pressure)
- Manufacturer's Name or Trademark
- Year of Manufacture

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40023, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40023, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40025 What requirements apply to safety-relief devices?** (1) Every container used in systems covered by WAC 296-307-400 must have one or more spring-loaded safety-relief valves or the equivalent.

(2) The discharge from safety-relief valves must be vented away from the container, upward, and unobstructed to the atmosphere. All safety-relief valve discharge openings must have suitable raincaps that allow free discharge of the vapor and prevent water from entering. You must provide a method to drain condensate. The rate of discharge must be as follows:

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
20	258	185	1,600	900	5,850
25	310	190	1,640	950	6,120
30	360	195	1,670	1,000	6,380
35	408	200	1,710	1,050	6,640
40	455	210	1,780	1,100	6,900
45	501	220	1,850	1,150	7,160
50	547	230	1,920	1,200	7,410
55	591	240	1,980	1,250	7,660
60	635	250	2,050	1,300	7,910
65	678	260	2,120	1,350	8,160
70	720	270	2,180	1,400	8,410
75	762	280	2,250	1,450	8,650
80	804	290	2,320	1,500	8,900
85	845	300	2,380	1,550	9,140
90	885	310	2,450	1,600	9,380
95	925	320	2,510	1,650	9,620
100	965	330	2,570	1,700	9,860
105	1,010	340	2,640	1,750	10,090
110	1,050	350	2,700	1,800	10,330
115	1,090	360	2,760	1,850	10,560
120	1,120	370	2,830	1,900	10,800
125	1,160	380	2,890	1,950	11,030
130	1,200	390	2,950	2,000	11,260
135	1,240	400	3,010	2,050	11,490
140	1,280	450	3,320	2,100	11,720
145	1,310	500	3,620	2,150	11,950
150	1,350	550	3,910	2,200	12,180
155	1,390	600	4,200	2,250	12,400
160	1,420	650	4,480	2,300	12,630
165	1,460	700	4,760	2,350	12,850
170	1,500	750	5,040	2,400	13,080
175	1,530	800	5,300	2,450	13,300
180	1,570	850	5,590	2,500	13,520

Surface area = total outside surface area of container in square feet. When the surface area is not stamped on the name plate or when the marking is not legible, calculate the area with one of the following formulas:

- Hemispherical heads: Area = (Length in feet) X (outside diameter in feet) X 3.1416.
- Other than hemispherical heads: Area = (Length in feet) + (0.3 outside diameter in feet) X (outside diameter in feet) X 3.1416.
- Spherical container: Area = (outside diameter in feet)<sup>2</sup> X 3.1416.
- Flow rate: CFM air = cubic feet per minute of air required at standard conditions, 60F and atmospheric pressure (14.7 psia).

For containers with total outside surface area greater than 2,500 sq. ft., the formula is: Flow rate CFM air = 22.11 A<sup>0.82</sup> where A = outside surface area of the container in square feet.

(3) Container safety-relief valves must be set for start to discharge as follows, according to the design pressure of the container.

Containers	Minimum	Maximum*
ASME U-68, U-69	110%	125%
ASME U-200, U-201	95%	100%
ASME 1952, 1956, 1959, 1962, 1965, 1968 or 1971	95%	100%
API-ASME	95%	100%

Containers	Minimum	Maximum*
U.S. Coast Guard	As required by USCG regulations	
DOT	As required by DOT regulations	

\*Note: Plus a relief valve manufacturer's tolerance of ten percent.

(4) Safety-relief devices used in systems covered by WAC 296-307-400 must be constructed to discharge at a rate equal to or greater than the rates required in subsection (2) of this section before the pressure exceeds 120% (not including the tolerance referred to in subsection (3) of this section) of the maximum permitted start-to-discharge pressure setting of the device.

(5) Safety-relief valves must be arranged to minimize tampering. If the pressure setting adjustment is external, the relief valves must have a sealable adjustment.

(6) Shut-off valves installed between the safety-relief valves and the containers or systems described in WAC 296-307-400 are prohibited.

Exception: A shut-off valve may be used where the arrangement of the valve allows the required capacity flow through the relief valves.

Exception example 1: A three-way valve installed under two safety-relief valves, each of which has the required rate of discharge and is installed to allow either of the safety-relief valves to be closed off, but does not allow both safety valves to be closed off at the same time.

Exception example 2: Two separate relief valves are installed with individual shut-off valves. The two shut-off valve stems must be mechanically interconnected to allow the full required flow of one safety-relief valve at all times.

Exception example 3: A safety-relief valve manifold that allows one valve of two, three, four or more to be closed off and the remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

(7) Safety-relief valves must have direct communication with the vapor space of the container.

(8) Each safety-relief valve used with systems described in WAC 296-307-400 must be plainly and permanently marked as follows:

(a) With the letters "AA" or the symbol NH<sub>3</sub>.

(b) The pressure in pounds per square inch gauge (psig) at which the valve is set to start to discharge.

(c) The rate of discharge of the valve in cubic feet per minute of air at 60°F and atmospheric pressure (14.7 psia).

(d) The manufacturers name and catalog number.

For example: A safety-relief valve marked AA-250-4200 (air) mean the valve is suitable for use on an anhydrous ammonia container; that it is set to start to discharge at 250 psig; and that its rate of discharge is 4,200 cubic feet per minute of air.

(9) No connection to the safety-relief valve may restrict the flow capacity on either the upstream or downstream side.

(10) The manufacturer or supplier of a safety-relief valve manifold must publish complete data showing the flow rating through the combined assembly of the manifold with safety-relief valves installed. The manifold flow rating must be determined by testing the manifold with all but one valve discharging. The flow rate must be determined by the restricted opening or openings or those having the lowest flow. The valve must be marked as required in subsection (7) of this section.

(11) A hydrostatic relief valve must be installed between each pair of valves in the liquid ammonia piping or hose

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where liquid may be trapped to release into the atmosphere at a safe location.

(12) Discharge from safety-relief devices must not terminate in or beneath any building.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40025, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40025; filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40025, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40027 What emergency precautions are required when handling anhydrous ammonia? (1)**

You must train employees required to handle ammonia in the safe operating practices and the proper action to take in an emergency. Employees must be instructed to use the equipment listed in subsection (3) of this section in an emergency.

(2) If ammonia system leaks, the employees trained for and designated to act in emergencies must:

(a) See that anyone not required to deal with an emergency is evacuated from the contaminated area.

(b) Have two suitable gas masks in readily accessible locations. Full face masks with ammonia canisters as certified by NIOSH under 42 CFR Part 84, are suitable for emergency action for most leaks, particularly those that occur outdoors. For protection in concentrated ammonia atmospheres, self-contained breathing apparatus is required.

(c) Wear gauntlet type plastic or rubber gloves and wear plastic or rubber suits in heavily contaminated atmospheres.

(d) Shut off the appropriate valves.

(3) All storage systems must have on hand at least the following equipment for emergency and rescue purposes:

(a) \*One full face gas mask with anhydrous ammonia refill canisters.

(b) \*\*One pair of protective gloves.

(c) \*\*One pair of protective boots.

(d) \*\*One protective slicker and/or protective pants and jacket.

(e) Easily accessible shower and/or at least 50 gallons of clean water in an open top container.

(f) Tight-fitting vented goggles or one full face shield.

\*If ammonia vapors are detected when the mask is applied, leave the area immediately. The life of a canister in service is controlled by the percentage of vapors to which it is exposed. Canisters must not be opened until ready for use and should be discarded after use or as recommended by the canister manufacturer. Unopened canisters may be guaranteed for as long as three years and all should be dated when received. In addition, an independently supplied air mask of the type used by fire departments may be used for emergencies.

\*\*Gloves, boots, slickers, jackets, and pants must be made of rubber or other material impervious to ammonia.

(4) Where several persons are usually present, additional safety equipment may be necessary.

(5) Each tank motor vehicle transporting anhydrous ammonia, except farm applicator vehicles, must carry a container of at least five gallons of water and must have a full face gas mask, a pair of tight-fitting goggles or one full face shield. The driver must be instructed in their use and the proper action to take to provide for the driver's safety.

(6) If a leak occurs in transportation equipment and it is impractical to stop the leak, the driver should move the vehicle to an isolated location.

(7) If liquid ammonia contacts the skin or eyes, the affected area should be promptly and thoroughly flushed with water. Do not use neutralizing solutions or ointments on affected areas. A physician must treat all cases of eye exposure to liquid ammonia.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-40027, filed 5/6/03, effective 8/1/03; 97-09-013, recodified as § 296-307-40027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40029 What requirements apply to filling densities?** Filling density means the percent ratio of the weight of the gas in a container to the weight of water at 60°F that the container will hold. One pound of water equals 27.737 cubic inches at 60°F. To determine the weight capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60°F in air must be 8.32828 pounds.

(1) The filling densities for nonrefrigerated containers must not exceed the following:

	Aboveground	Underground
(i) Uninsulated	56%	58%
(ii) Insulated	57%	

(iii) DOT containers shall be filled according to DOT regulations.

This corresponds to 82% by volume at -28°F, 85% by volume at 5°F, 87.5% by volume at 30°F, and 90.6% by volume at 60°F.

(2) When containers are filled according to liquid level by any gauging method other than a fixed length dip tube gauge, each container should have a thermometer well so that the internal liquid temperature can be easily determined and the amount of liquid and vapor in the container corrected to a 60°F basis.

[97-09-013, recodified as § 296-307-40029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40029, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40031 What requirements apply to the transfer of liquids?** (1) Anhydrous ammonia must always be at a temperature suitable for the material of construction and design of the receiving containers. Ordinary steels are not suitable for refrigerated ammonia. See Appendix R of API Standard 620 "Recommended Rules for Design and Construction of Large Welded Low-Pressure Storage Tanks" for materials for low temperature service.

(2) At least one attendant must supervise the transfer of liquids from the time the connections are first made until they are finally disconnected.

(3) Flammable gases or gases that will react with ammonia (such as air) must not be used to unload tank cars or transport trucks.

(4) Containers must be charged or used only on authorization of the owner.

(5) Containers must be gauged and charged only in the open atmosphere or in buildings approved for that purpose.

(6) Pumps used for transferring ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Pumps must be designed for at least 250 psig working pressure.

(b) Positive displacement pumps must have installed, off the discharge port, a constant differential relief valve discharging into the suction port of the pump through a line large enough to carry the full capacity of the pump at relief valve setting. The setting and installation must be according to the pump manufacturer's recommendations.

(c) On the discharge side of the pump, before the relief valve line, there must be a pressure gauge graduated from 0 to 400 psig installed.

(d) Plant piping must contain shut-off valves located as close as practical to pump connections.

(7) Compressors used for transferring or refrigerating ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Compressors, except those used for refrigeration, must be designed for at least 250 psig working pressure. Crank cases of compressors not designed to withstand system pressure must be protected with a suitable safety-relief valve.

(b) Plant piping must have shut-off valves located as close as practical to compressor connections.

(c) A safety-relief valve large enough to discharge the full capacity of the compressor must be connected to the discharge before any shut-off valve.

(d) Compressors must have pressure gauges at suction and discharge graduated to at least one and one-half times the maximum pressure that can develop.

(e) Adequate means, such as drainable liquid trap, must be provided on the compressor suction to minimize the entry of liquid into the compressor.

(f) Where necessary to prevent contamination, an oil separator must be provided on the discharge side of the compressor.

(8) Loading and unloading systems must be protected by suitable devices to prevent emptying of the storage container or the container being loaded or unloaded if the hose is cut. Backflow check valves or properly sized excess flow valves must be installed where necessary to provide this protection. In the event that valves are not practical, remotely operated shut-off valves may be installed.

(9) Meters used to measure liquid anhydrous ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Liquid meters must be designed for a minimum working pressure of 250 psig.

(b) The metering system must incorporate devices that will prevent the inadvertent measurement of vapor.

[97-09-013, recodified as § 296-307-40031, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40031, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40033 What requirements apply to tank car unloading points and operations?** (1) Provisions for unloading tank cars must meet DOT requirements.

(2) Unloading operations must be performed by reliable employees who are properly instructed and responsible for careful compliance with all procedures.

(3) Caution signs must be placed on the track or car to give necessary warning to anyone approaching car from the open end of the siding. The signs must be left up until after car is unloaded and disconnected from discharge connections. Signs must be of metal or other suitable material, at least 12 by 15 inches, and bear the words "STOP—Tank car connected" or "STOP—Men at work." The word "STOP" must be in letters at least four inches high and the other words in letters at least two inches high. The letters must be white on a blue background.

(4) The track of a tank car siding must be substantially level.

(5) Brakes must be set and wheels blocked on all cars being unloaded.

(6) Tank cars of anhydrous ammonia must be unloaded only at approved locations meeting the requirements of WAC 296-307-40025(4) and 296-307-40031(8).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40033, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40035 What requirements apply to the liquid-level gauging device?** (1) Each container except those filled by weight must have an approved liquid-level gauging device.

(2) All gauging devices must be arranged so that the maximum liquid level to which the container is filled is easily determined.

(3) Gauging devices that require bleeding of the product to the atmosphere such as the rotary tube, fixed tube, and slip tube devices, must be designed so that the maximum opening of the bleed valve is a maximum of No. 54 drill size unless provided with an excess flow valve.

(4) Gauging devices must have a design pressure equal to or greater than the design pressure of the container on which they are installed.

(5) Fixed liquid-level gauges must be designed so that the maximum volume of the container filled by liquid is a maximum of 85% of its water capacity. The coupling into which the fixed liquid-level gauge is threaded must be placed at the 85% level of the container. If located elsewhere, the dip tube of this gauge must be installed so that it cannot be readily removed.

Note: This does not apply to refrigerated storage.

(6) Columnar gauge glasses must be restricted to stationary storage installation. They must have shut-off valves having metallic hand wheels, excess flow valves, and extra heavy glass adequately protected by a metal housing applied by the gauge manufacturer. They must be shielded against the direct rays of the sun.

[97-09-013, recodified as § 296-307-40035, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40035, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40037 How should aboveground uninsulated containers be maintained?** Aboveground uninsulated

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containers should have a reflective surface maintained in good condition. We recommend white for painted surfaces, but other light reflecting colors are acceptable.

[97-09-013, recodified as § 296-307-40037, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40037, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-40039 What requirements apply to electrical equipment and wiring?** (1) Electrical equipment and wiring for use in ammonia installations must be general purpose or weather resistant as appropriate.

(2) Where concentrations of ammonia in the air in excess of 16% by volume are likely to be encountered, electrical equipment and wiring must be specified by and installed according to chapter 296-307 WAC Part T, for Class I, Group D locations.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40039, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-40039, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40039, filed 10/31/96, effective 12/1/96.]

## Part U-2

### Hazardous Materials—Liquefied Petroleum Gas

**WAC 296-307-410 Storage and handling of liquefied petroleum gases.**

[97-09-013, recodified as § 296-307-410, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-410, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41001 What does this part cover?** Chapter 296-307 WAC Part U2 covers the storage and handling of liquefied petroleum gases.

The requirements of WAC 296-307-410 apply to all LP-gas installations covered by this part.

For additional requirements related to:	See WAC:
Cylinder systems	296-307-415
Systems using non-DOT containers	296-307-420
LP-gas as a motor fuel	296-307-425
Storage of containers awaiting use or resale	296-307-430
LP-gas installations on commercial vehicles	296-307-435
LP-gas service stations	296-307-440

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41003 Which LP-gas installations are not covered by this part?** (1) This part does not apply to:

(a) LP-gas refrigerated storage systems;

(b) LP-gas used with oxygen;

(c) LP-gas used in utility gas plants (covered by the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants, NFPA No. 59-1968);

(d) Low-pressure (less than 1/2 pound per square inch or 14 inches water column) LP-gas piping systems, and the installation and operation of residential and commercial appliances supplied through such systems. The National Fire Protection Association Standard for the Installation of Gas

Appliances and Gas Piping, NFPA 54-1969 apply to these systems.

(2) LP-gas installations, equipment, and appliances that met the requirements of the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases NFPA No. 58-1972, 1973 at the time of manufacture or installation may be used if they do not create a hazard to employees.

[97-09-013, recodified as § 296-307-41003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41005 What definitions apply to this part?** "Adequate ventilation," for fire prevention during normal operation, means the concentration of the gas in a gas-air mixture does not exceed 25% of the lower flammable limit.

"Containers" means all vessels, such as tanks, cylinders, or drums, used to transport or store LP-gases.

"DOT" means the federal Department of Transportation.

"DOT container" means a container that meets DOT regulations.

"DOT cylinder" means a cylinder that meets DOT regulations.

"DOT regulations/requirements/specifications" means the DOT regulations of 49 CFR part 178.

"Liquefied petroleum gases" and "LP-gas" means any material that is composed mostly of any of the following: Hydrocarbons, or mixtures of them; propane; propylene; butanes (normal butane or iso-butane); and butylenes.

"PSIA" pounds per square inch absolute.

"PSIG" means pounds per square inch gauge.

"Systems" means an assembly of the container or containers, major devices such as vaporizers, safety-relief valves, excess flow valves, regulators, and piping connecting such parts.

"Vaporizer-burner" means an integral vaporizer-burner unit, dependent upon the heat generated by the burner to vaporize the liquid used for dehydrators or dryers.

[97-09-013, recodified as § 296-307-41005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41007 When must LP-gas be odorized?** You must ensure that all LP-gas is odorized by an approved agent to indicate by distinct odor, the presence of gas down to concentration in air of a maximum of 1/5 the lower limit of flammability.

Exception: Odorization is not required if it will create a hazard in further processing, or if it serves no useful purpose as a warning agent.

Note: The odorization requirement may be met by using 1.0 pounds of ethyl mercaptan, 1.0 pounds of thiophene, or 1.4 pounds of amyl mercaptan per ten thousand gallons of LP-gas. You may use any odorant and quantity that meets the requirements of this section.

[97-09-013, recodified as § 296-307-41007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41009 Must LP-gas containers and equipment be approved?** (1) Each system of DOT contain-

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ers must have approved container valves, connectors, manifold valve assemblies, and regulators.

(2) Each non-DOT system using containers of 2,000 gallons or less water capacity, must have a container assembly, one or more regulators, and other necessary parts. The entire system, or the container assembly with the regulators, must be individually listed by a nationally recognized testing laboratory.

"Container assembly" means the container and fittings for all openings, including shut-off valves, excess flow valves, liquid-level gauging devices, safety-relief devices, and protective housing.

(3) In systems using containers of over 2,000 gallons water capacity, each regulator, container, valve, excess flow valve, gauging device, and relief valve, must be listed by a nationally recognized testing laboratory.

(4) All DOT containers must be constructed, tested, and stamped according to the DOT specifications effective at the date of their manufacture.

[97-09-013, recodified as § 296-307-41009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41011 What construction and test requirements must containers meet?** (1) Containers must be designed, constructed, and tested according to the *Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code*, 1968 edition, unless otherwise specified.

(2) Containers constructed according to the 1949 and earlier editions of the ASME Code are exempt from U-2 through U-10 and U-19 of the code. Containers constructed according to U-70 in the 1949 and earlier editions do not meet the requirements of this section.

(3) Containers designed, constructed, and tested prior to July 1, 1961, according to the *Code for Unfired Pressure Vessels for Petroleum Liquids and Gases*, 1951 edition with 1954 Addenda, of the American Petroleum Institute and the American Society of Mechanical Engineers are considered in compliance. Containers constructed according to API-ASME Code do not have to comply with section I or with the appendix to section I. W-601 through W-606 in the 1943 and earlier editions do not apply.

[97-09-013, recodified as § 296-307-41011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41013 How must containers be welded?** (1) You must ensure that all welding to the shell, head, or any other part of the container subject to internal pressure, meets the requirements of the code under which the tank was fabricated. You may weld on saddle plates, lugs, or brackets attached to the container by the tank manufacturer.

(2) When you must repair or modify DOT containers by welding, you must return the container to a qualified manufacturer, making containers of the same type, to make the repair or modification according to DOT regulations.

[97-09-013, recodified as § 296-307-41013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41015 How must containers be marked?** (1) You must ensure that containers are marked according to DOT regulations or with the following:

(a) Indication that the container meets the requirements of the code under which it is constructed, and all marks required by that code.

(b) Indication whether the container is designed for underground or aboveground installation or both. If intended for both and different style hoods are provided, the marking must indicate the proper hood for each type of installation.

(c) The name and address of the supplier of the container, or with the trade name of the container.

(d) The water capacity of the container in pounds or gallons, United States standard.

(e) The pressure in psig, for which the container is designed.

(f) The wording "This container must not contain a product with a vapor pressure greater than \_ psig at 100°F."

(g) The tare weight, for containers with a water capacity of three hundred pounds or less.

(h) Indication of the maximum fill level for liquid at temperatures between 20°F and 130°F. Markings must be in maximum increments of 20°F. This marking may be located on the liquid level gauging device.

Exception: Containers provided with fixed maximum level indicators or that are filled by weighing are exempt from this requirement.

(i) The outside surface area in square feet.

(2) The markings must be on a metal nameplate attached to the container so that it is visible after the container is installed.

(3) When LP-gas and one or more other gases are stored or used in the same area, the containers must be marked to identify their content. Marking must be according to American National Standard Z48.1-1954, "Method of Marking Portable Compressed Gas Containers to Identify the Material Contained."

[97-09-013, recodified as § 296-307-41015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41017 Where must containers be located?** You must ensure that containers are located according to the following:

(1) Containers and first stage regulating equipment are located outdoors.

Containers may be located indoors under any of the following conditions:

(a) In buildings used exclusively for container charging, vaporization pressure reduction, gas mixing, gas manufacturing, or distribution;

(b) When portable use is necessary and meets the requirements of WAC 296-307-41509;

(c) LP-gas fueled stationary or portable engines that meet the requirements of WAC 296-307-42521 or 296-307-42523;

(d) LP-gas fueled industrial trucks that meet the requirements of WAC 296-307-42525;

(e) LP-gas fueled vehicles garaged according to WAC 296-307-42527; or

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(f) Containers awaiting use or resale when stored according to WAC 296-307-430.

(2) Each individual container is located away from the nearest important building, group of buildings, or line of adjoining property that may be built on, according to Table U-1.

TABLE U-1  
Minimum distances

Water capacity per container	Containers		Between above-ground containers
	Under-ground	Above-ground	
Less than 125 gals <sup>a</sup>	10 feet	None	None
125-250 gals	10 feet	10 feet	None
251-500 gals	10 feet	10 feet	3 feet
501-2,000 gals	25 feet <sup>b</sup>	25 feet <sup>b</sup>	3 feet
2,001-30,000 gals	50 feet	50 feet	5 feet
30,001-70,000 gals	50 feet	75 feet	1/4 of sum of diameters of adjacent containers
70,001-90,000 gals	50 feet	100 feet	1/4 of sum of diameters of adjacent containers

(a) If the total water capacity of a multicontainer installation at a consumer site is 501 gallons or more, the minimum distance must comply with this table, applying the aggregate capacity instead of the capacity per container. For multiple installations, installations must be at least twenty-five feet apart. Do not apply the MINIMUM DISTANCES BETWEEN ABOVEGROUND CONTAINERS to such installations.

(b) Distance requirements may be reduced to 10 feet for a single container of 1200 gallons water capacity or less, if the container is at least 25 feet from any other LP-gas container of more than 125 gallons water capacity.

(c) In buildings devoted exclusively to gas manufacturing and distributing operations, the distances may be reduced if no containers of more than 500 gallons water capacity are located closer than ten feet to gas manufacturing and distributing buildings.

(3) Containers installed for use must not be stacked one above the other.

(4) In industrial installations involving containers of 180,000 gallons total water capacity or more, where serious exposures from the container to adjacent properties are common, firewalls or other means of protection designed and constructed according to good engineering practices are required.

(5) Readily ignitable material such as weeds and long dry grass is removed within ten feet of any container.

(6) The minimum separation between LP-gas containers and flammable liquid tanks is twenty feet; the minimum separation between a container and the centerline of the dike is ten feet.

EXCEPTION: This does not apply when LP-gas containers of 125 gallons or less capacity are installed adjacent to Class

III flammable liquid tanks of 275 gallons or less capacity.

(7) The accumulation of flammable liquids under adjacent LP-gas containers is prevented by a means such as diking, diversion curbs, or grading.

(8) When dikes are used with flammable liquid tanks, no LP-gas containers are located within the diked area.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41017, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41019 What requirements apply to valves and accessories?** (1) Valves, fittings, and accessories connected directly to the container including primary shut-off valves, must have a rated working pressure of at least 250 psig and must be of material and design suitable for LP-gas service. The use of cast iron for container valves, fittings, and accessories is prohibited. Container valves may be made of malleable or nodular iron.

(2) Connections to containers must have shut-off valves located as close to the container as practical.

Exception: This does not apply to safety-relief connections, liquid level gauging devices, and plugged openings.

(3) All required excess flow valves must close automatically at the rated flows of vapor or liquid specified by the manufacturer. The connections, lines, valves, and fittings must have a greater capacity than the rated flow of the excess flow valve.

(4) Liquid level gauging devices that are constructed so that outward flow is a maximum of that passed by a No. 54 drill size opening may be installed without excess flow valves.

(5) Openings from container or through fittings attached directly on container to which pressure gauge connection is made, need not have shut-off or excess flow valves if such openings are restricted to not larger than No. 54 drill size opening.

(6) Required excess flow and back pressure check valves must be located inside the container or outside where the line enters the container. When located outside, the installation must be made to prevent any stress beyond the excess flow or back pressure check valve from causing a break between the container and the valve.

Exception: This does not apply to systems using containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity).

(7) Excess flow valves must be designed with a bypass that is a maximum of No. 60 drill size opening to allow equalization of pressures.

(8) Containers of more than 30 gallons water capacity and less than 2,000 gallons water capacity, filled on a volumetric basis, and manufactured after December 1, 1963, must be equipped for filling into the vapor space.

[97-09-013, recodified as § 296-307-41019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41019, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41021 What requirements apply to piping, tubing, and fittings?** (1) Pipe must be wrought iron

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or steel (black or galvanized), brass, copper, or aluminum alloy. Aluminum alloy pipe must be at least Schedule 40 according to the specifications for Aluminum Alloy Pipe, ANSI H38.7-1969 (ASTM, B241-1969), and must be suitably marked at each end of each length indicating compliance with ANSI specifications. Alloy 5456 is prohibited.

Exception: This does not apply to piping for LP-gas used as a motor fuel or to piping on commercial vehicles.

(2) Aluminum alloy pipe must be protected against external corrosion whenever:

(a) It is in contact with dissimilar metals other than galvanized steel; or

(b) Its location is subject to repeated wetting by such liquids as water (except rain water), detergents, sewage, or leaking from other piping; or

(c) It passes through flooring, plaster, masonry, or insulation.

Galvanized sheet steel or pipe, galvanized inside and out, are considered suitable protection.

(3) Aluminum pipe must be three-fourths inch nominal and shall not be used for pressures exceeding 20 psig. Aluminum alloy pipe must not be installed within six inches of the ground.

(a) Vapor piping with operating pressures not exceeding 125 psig must be suitable for a working pressure of at least 125 psig. Pipe must be at least Schedule 40 ASTM A-53-69, Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal.

(b) Vapor piping with operating pressures over 125 psig and all liquid piping must be suitable for a working pressure of at least 250 psig. Pipe must be at least Schedule 80 if joints are threaded or threaded and back welded. At least Schedule 40 (ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal) must be used if joints are welded, or welded and flanged.

(4) Tubing must be seamless copper, brass, steel, or aluminum alloy. Copper tubing must be of Type K or L or equivalent as covered in the Specification for Seamless Copper Water Tube, ANSI H23.1-1970 (ASTM B88-1969). Aluminum alloy tubing must be of Type A or B or equivalent as covered in Specification ASTM B210-1968 and must be suitably marked every 18 inches indicating compliance with ASTM specifications. The minimum nominal wall thickness of copper tubing and aluminum alloy tubing must be as specified in Table U-2 and Table U-3.

TABLE U-2

WALL THICKNESS OF COPPER TUBING<sup>1</sup>

Note: The standard tube size is one-eighth-inch smaller than its nominal outside diameter.

Standard size (inches)	Nominal O.D. (inches)	Nominal wall thickness (inches)	
		Type K	Type L
1/4	0.375	0.035	0.030
3/8	0.500	0.049	0.035
1/2	0.625	0.049	0.040
5/8	0.750	0.049	0.042
3/4	0.875	0.065	0.045
1	1.125	0.065	0.050
1 1/4	1.375	0.065	0.055

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Standard size (inches)	Nominal O.D. (inches)	Nominal wall thickness (inches)	
		Type K	Type L
1 1/2	1.625	0.072	0.060
2	2.125	0.083	0.070

<sup>1</sup>Based on data in Specification for Seamless Copper Water Tubing, ANSI H23.1-1970 (ASTM B-88-69).

TABLE U-3

WALL THICKNESS OF ALUMINUM ALLOY TUBING<sup>1</sup>

Outside diameter (inches)	Nominal wall thickness (inches)	
	Type A	Type B
3/8	0.035	0.049
1/2	0.035	0.049
5/8	0.042	0.049
3/4	0.049	0.058

<sup>1</sup>Based on data in Standard Specification for Aluminum-Alloy Drawn Seamless Coiled Tubes for Special Purpose Applications, ASTM B210-68.

(5) Aluminum alloy tubing must be protected against external corrosion whenever:

(a) It is in contact with dissimilar metals other than galvanized steel; or

(b) Its location is subject to repeated wetting by liquids such as water (except rainwater), detergents, sewage, or leakage from other piping; or

(c) It passes through flooring, plaster, masonry, or insulation.

Galvanized sheet steel or pipe, galvanized inside and out, are considered suitable protection.

(6) The maximum outside diameter for aluminum alloy tubing must be three-fourths inch and must not be used for pressures exceeding 20 psig. Aluminum alloy tubing installed within six inches of the ground is prohibited.

(7) In systems where the gas in liquid form enters the building without pressure reduction, only heavy walled seamless brass or copper tubing with an internal diameter a maximum of 3/32 inch, and a wall thickness of at least 3/64 inch shall be used.

Exception: This requirement does not apply to research and experimental laboratories, buildings or separate fire divisions of buildings used exclusively for housing internal combustion engines, and to commercial gas plants or bulk stations where containers are charged, nor to industrial vaporizer buildings, nor to buildings, structures, or equipment under construction or undergoing major renovation.

(8) Pipe joints must be screwed, flanged, welded, soldered, or brazed with a material having a melting point over 1,000°F. Joints on seamless copper, brass, steel, or aluminum alloy gas tubing shall be made by approved gas tubing fittings, or soldered or brazed with a material having a melting point over 1,000°F.

(9) For operating pressures of 125 psig or less, fittings must be designed for a pressure of at least 125 psig. For operating pressures above 125 psig, fittings must be designed for a minimum of 250 psig.

(10) Threaded cast iron pipe fittings are prohibited. Aluminum alloy fittings must be used with aluminum alloy pipe and tubing. Insulated fittings must be used where aluminum alloy pipe or tubing connects with a dissimilar metal. You

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may use malleable, nodular, or higher strength gray iron for fittings.

Note: Strainers, regulators, meters, compressors, pumps, etc., are not to be considered as pipe fittings.

(11) All materials such as valve seats, packing, gaskets, diaphragms, etc., must be resistant to the action of LP-gas under the service conditions to which they are subjected.

(12) All piping, tubing, or hose must be tested after assembly and proved free from leaks at least normal operating pressures. After installation, piping and tubing of all domestic and commercial systems must be tested and proved free of leaks using a manometer or equivalent device that will indicate a drop in pressure. Test made by flame is prohibited.

(13) You must ensure that piping allows for expansion, contraction, jarring, and vibration, and settling. You may use flexible connections.

(14) Piping outside buildings may be buried, above-ground, or both, but must be well supported and protected against physical damage. Where soil conditions warrant, all piping must be protected against corrosion. Where condensation may occur, the piping must be pitched back to the container, or you must provide a means for revaporization of the condensate.

[97-09-013, recodified as § 296-307-41021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41023 What specifications must hoses meet?** (1) Hose shall be fabricated of materials that are resistant to the action of LP-gas in the liquid and vapor phases. If wire braid is used for reinforcing the hose, it must be of corrosion-resistant material such as stainless steel.

(2) Hose subject to container pressure must be marked "LP-gas" or "LPG" at not greater than ten-foot intervals.

(3) Hose subject to container pressure must be designed for a bursting pressure of not less than 1,250 psig.

(4) Hose subject to container pressure must be listed by a nationally recognized testing laboratory.

(5) Hose connections subject to container pressure must be able to withstand, without leaking, a test pressure of not less than 500 psig.

(6) Hose and hose connections on the low-pressure side of the regulator or reducing valve must be designed for a bursting pressure of not less than 125 psig or five times the set pressure of the relief devices protecting that portion of the system, whichever is higher.

(7) Hose may be used on the low-pressure side of regulators to connect to other than domestic and commercial gas appliances under the following conditions:

(a) The appliances connected with hose are portable and need a flexible connection.

(b) For use inside buildings, the hose is of minimum practical length, but is a maximum of six feet. Hose must not extend from one room to another, nor pass through any walls, partitions, ceilings, or floors. Such hose must not be concealed from view or used in a concealed location.

Exception: For use outside of buildings, the hose may exceed this length but must be kept as short as practical.

(c) The hose must be approved and must not be used where it may be exposed to temperatures above 125°F. The

hose must be securely connected to the appliance. Rubber slip ends are prohibited.

(d) The shut-off valve for an appliance connected by hose must be in the metal pipe or tubing and not at the appliance end of the hose. When shut-off valves are installed close to each other, precautions must be taken to prevent operation of the wrong valve.

(e) Hose used for connecting to wall outlets must be protected from physical damage.

[97-09-013, recodified as § 296-307-41023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41023, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41025 What requirements apply to safety devices?** (1) Every container except those constructed according to DOT specifications and every vaporizer (except motor fuel vaporizers and vaporizers described in WAC 296-307-41029(3) and 296-307-42007 (6)(a) whether heated by artificial means or not, must have one or more safety-relief valves of spring-loaded or equivalent type. These valves must be arranged to afford free vent to the outer air with discharge not less than five feet horizontally away from any opening into the building that is below such discharge. The rate of discharge must be according to the requirements of subsection (2) or (4) of this section.

(2) Minimum required rate of discharge in cubic feet per minute of air at one hundred twenty percent of the maximum permitted start to discharge pressure for safety-relief valves to be used on containers other than those constructed according to DOT specification must be as follows:

Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air
20 or less	626	170	3,620	550	9,470
25	751	175	3,700	600	10,170
30	872	180	3,790	650	10,860
35	990	185	3,880	700	11,550
40	1,100	190	3,960	750	12,220
45	1,220	195	4,050	800	13,540
50	1,330	200	4,130	900	14,190
55	1,430	210	4,300	950	14,830
60	1,540	220	4,470	1,000	15,470
65	1,640	230	4,630	1,050	16,100
70	1,750	240	4,800	1,100	16,720
75	1,850	250	4,960	1,150	17,350
80	1,950	260	5,130	1,200	17,960
85	2,050	270	5,290	1,250	18,570
90	2,150	280	5,450	1,300	19,180
95	2,240	290	5,610	1,350	19,780
100	2,340	300	5,760	1,400	20,380
105	2,440	310	5,920	1,450	20,980
110	2,530	320	6,080	1,500	21,570
115	2,630	330	6,230	1,550	22,160
120	2,720	340	6,390	1,600	22,740
125	2,810	350	6,540	1,650	23,320
130	2,900	360	6,690	1,700	23,900
135	2,990	370	6,840	1,750	24,470
140	3,080	380	7,000	1,800	25,050
145	3,170	390	7,150	1,850	25,620

Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air
150	3,260	400	7,300	1,900	26,180
155	3,350	450	8,040	1,950	26,750
160	3,440	500	8,760	2,000	27,310
165	3,530				

Surface area = total outside surface area of container in square feet.

(3) When the surface area is not stamped on the name plate or when the marking is not legible, calculate the area with one of the following formulas:

- Hemispherical heads: Area = (overall length) X (outside diameter) X 3.1416.

- Other than hemispherical heads: Area = (overall length) + 0.3 (outside diameter) X (outside diameter) X 3.1416.

Note: This formula is not exact, but will give results within the limits of practical accuracy for the sole purpose of sizing relief valves.

- Spherical container: Area = (outside diameter)<sup>2</sup> X 3.1416.

- Flow rate: CFM air = required flow capacity in cubic feet per minute of air at standard conditions, 60°F and atmospheric pressure (14.7 psia).

For containers with total outside surface area greater than 2,000 sq. ft., the formula is: Flow rate CFM air = 53.632 A<sup>0.82</sup> where A = outside surface area of the container in square feet.

Valves not marked "air" have flow rate marking in cubic feet per minute of LP-gas. These can be converted to ratings in cubic feet per minute of air by multiplying the LP-gas ratings by factors listed below. Air flow ratings can be converted to ratings in cubic feet per minute of LP-gas by dividing the air ratings by the factors listed below.

**AIR CONVERSION FACTORS**

Container type	100	125	150	175	200
Air conversion factor	1.162	1.142	1.113	1.078	1.010

(4) The minimum required rate of discharge for safety-relief valves for LP-gas vaporizers (steam heated, water heated, and direct fired) must be determined as follows:

(a) Obtain the total surface area by adding the surface area of vaporizer shell in square feet directly in contact with LP-gas and the heat exchanged surface area in square feet directly in contact with LP-gas.

(b) Obtain the minimum required rate of discharge in cubic feet of air per minute, at 60°F and 14.7 psia from subsection (2) of this section, for this total surface area.

(5) Container and vaporizer safety-relief valves must be set to start to discharge, with relation to the design pressure of the container, according to the following:

Containers	Minimum (percent)	Maximum (percent)
ASME Code; Par. U-68, U-69—1949 and earlier editions	110	*125

Containers	Minimum (percent)	Maximum (percent)
ASME Code; Par. U-200, U-201—1949 edition	88	*100
ASME Code—1950, 1952, 1956, 1959, 1962, 1965 and 1968 (Division I) editions	88	*100
API—ASME Code—all editions	88	*100
DOT	As prescribed in 49 CFR Chapter I	

\*Manufacturers of safety-relief valves are allowed a plus tolerance not exceeding 10% of the set pressure marked on the valve.

(6) Safety-relief devices used with systems employing non-DOT containers must be constructed to discharge at not less than the rates shown in subsection (2) of this section, before the pressure is in excess of 120% of the maximum (not including the 10% referred to in subsection (5) of this section) permitted start-to-discharge pressure setting of the device.

(7) In high temperature areas, you must use a lower vapor pressure product or a higher designed pressure vessel to prevent the safety valves from opening. The tanks may be protected by cooling devices such as spraying, shading, or other means.

(8) Safety-relief valves must be arranged to minimize tampering. For external pressure setting or adjustment, the relief valves must have an approved sealable adjustment.

(9) Shut-off valves are prohibited between safety-relief devices and the container, equipment, or piping.

EXCEPTION: A shut-off valve may be used where the arrangement of the valve allows the required capacity flow through the safety-relief device.

(10) Safety-relief valves must have direct communication with the vapor space of the container.

(11) Each safety-relief valve must be plainly and permanently marked with the following:

(a) Container type of the pressure vessel on which the valve is designed to be installed;

(b) The pressure in psig at which the valve is set to discharge;

(c) The actual rate of discharge of the valve in cubic feet per minute of air at 60°F and 14.7 psia; and

(d) The manufacturer's name and catalog number.

For example: T200-250-4050 AIR: Indicates that the valve is suitable for use on a Type 200 container, that it is set to start to discharge at 250 psig; and that its rate of discharge is 4,050 cubic feet per minute of air.

(12) Safety-relief valve assemblies and their connections must be large enough to provide the required rate of flow for the container on which they are installed.

(13) A hydrostatic relief valve must be installed between each pair of shut-off valves on LP-gas liquid piping. The start-to-discharge pressure setting of such relief valves must be a maximum of 500 psig. The minimum setting on relief valves installed in piping connected to non-DOT containers shall be 140% of the container relief valve setting. For piping connected to DOT containers, the minimum must be 400 psig. The relief valve should not be installed in the pump dis-

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charge piping if the same protection can be provided by installing the relief valve in the suction piping. The start-to-discharge pressure setting of such a relief valve, if installed on the discharge side of a pump, must exceed the maximum pressure permitted by the recirculation device in the system.

(14) The discharge from any safety-relief device must not terminate in or beneath any building.

EXCEPTION: This requirement does not apply to relief devices covered by WAC 296-307-41017(1), 296-307-41507(1), or 296-307-41509.

(15) Container safety-relief devices and regulator relief vents must be located at least five feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41025, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41025, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41027 How must indirect fired vaporizers be constructed and installed?** Indirect fired vaporizers utilizing steam, water, or other heating medium must be constructed and installed according to the following:

(1) Vaporizers must be constructed according to the requirements of WAC 296-307-41011 and must be permanently marked as follows:

(a) With the code marking signifying the specifications to which the vaporizer is constructed;

(b) With the allowable working pressure and temperature for which the vaporizer is designed;

(c) With the sum of the outside surface area and the inside heat exchange surface area expressed in square feet; and

(d) With the name or symbol of the manufacturer.

(2) Vaporizers with an inside diameter of six inches or less exempted by the ASME Unfired Pressure Vessel Code, Section VIII of the ASME Boiler and Pressure Vessel Code, 1968, must have a design pressure of at least 250 psig and need not be permanently marked.

(3) Heating or cooling coils installed inside a storage container are prohibited.

(4) Vaporizers may be installed in buildings, rooms, sheds, or lean-tos used exclusively for gas manufacturing or distribution, or in other light, noncombustible structures that are well ventilated near the floor line and roof.

Exception: When vaporizing and/or mixing equipment is in a structure not used exclusively for gas manufacturing or distribution, the structure or room must be separated from the remainder of the building. The separation must be a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipe or conduit passing through it. Such structure or room must have adequate ventilation and must have a roof or at least one exterior wall of lightweight construction.

(5) All DOT vaporizers must have, at or near the discharge, a safety-relief valve providing an effective rate of discharge according to WAC 296-307-41025.

(6) The heating medium lines into and out of the vaporizer must have a mechanism to prevent the flow of gas into the heat systems in the event of tube rupture in the vaporizer. Vaporizers must have an automatic means to prevent liquid

from passing through the vaporizers to the gas discharge piping.

(7) The device that supplies heat to produce steam, hot water, or other heat may be installed in a building, compartment, room, or lean-to ventilated near the floorline and roof to the outside. The device must be separated from all compartments or rooms containing LP-gas vaporizers, pumps, and central gas mixing devices by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipes or conduit passing through it.

Exception: This requirement does not apply to the domestic water heaters that may supply heat for a vaporizer in a domestic system.

(8) Gas-fired heating systems supplying heat exclusively for vaporization must have automatic safety devices to shut off the flow of gas to main burners, if the pilot light should fail.

(9) Vaporizers may be an integral part of a fuel storage container directly connected to the liquid section or gas section or both.

(10) Fusible plugs are prohibited on vaporizers.

(11) Vaporizer houses must not have unprotected drains to sewers or sump pits.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41027, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41029 How must atmospheric vaporizers be constructed and installed?** Atmospheric vaporizers using heat from the ground or surrounding air must be installed as follows:

(1) Buried underground; or

(2) Located inside the building near where the pipe enters the building, if the capacity of the unit does not exceed one quart;

(3) Vaporizers of less than one quart capacity heated by the ground or surrounding air, may be installed without safety-relief valves if tests show that the assembly is safe.

[97-09-013, recodified as § 296-307-41029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41029, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41031 How must direct gas-fired vaporizers be constructed and installed?** Direct gas-fired vaporizers must be constructed, marked, and installed as follows:

(1) According to the requirements of the *American Society of Mechanical Engineers Boiler and Pressure Vessel Code*, 1968, that apply to the maximum working conditions for which the vaporizer is designed.

(2) With the name of the manufacturer; rated Btu input to the burner; the area of the heat exchange surface in square feet; the outside surface of the vaporizer in square feet; and the maximum vaporizing capacity in gallons per hour.

(3) Vaporizers may be connected to the liquid section or the gas section of the storage container, or both. The container must have a manually operated valve in each connection that completely shuts off when desired, all flow of gas or liquid from container to vaporizer.

(4) Vaporizers with a maximum capacity of 35 gallons per hour must be located at least 5 feet from container shut-off valves. Vaporizers more than 35 gallon capacity but a maximum of 100 gallons per hour must be located at least 10 feet from the container shut-off valves. Vaporizers having a capacity greater than 100 gallons per hour must be located at least 15 feet from container shut-off valves.

(5) Vaporizers may be installed in buildings, rooms, housings, sheds, or lean-tos used exclusively for vaporizing or mixing of LP-gas. Vaporizing housing structures must be noncombustible, and well ventilated near the floorline and the highest point of the roof. When vaporizer and/or mixing equipment is located in a structure or room attached to or within a building, such structure or room must be separated from the remainder of the building by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipes or conduit passing through it. The structure or room must have adequate ventilation, and a roof or at least one exterior wall of light-weight construction.

(6) Vaporizers must have at or near the discharge, a safety-relief valve providing an effective rate of discharge according to WAC 296-307-41025. The relief valve must be located where it is not subjected to temperatures over 140°F.

(7) Vaporizers must have suitable automatic means to prevent liquid passing from the vaporizer to the gas discharge piping of the vaporizer.

(8) Vaporizers must have means for manually turning off the gas to the main burner and pilot.

(9) Vaporizers must have automatic safety devices to shut off the flow of gas to main burners if the pilot light should fail. When the flow through the pilot exceeds 2,000 Btu per hour, the pilot also must have an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(10) Pressure regulating and pressure reducing equipment located within 10 feet of a direct fired vaporizer must be separated from the open flame by an airtight noncombustible partition.

(11) Except as provided in subsection (5) of this section, the following minimum distances must be maintained between direct fired vaporizers and the nearest important building, group of buildings, or line of adjoining property that may be built on:

(a) Ten feet for vaporizers with a vaporizing capacity of 15 gallons per hour or less;

(b) Twenty-five feet for vaporizers with a vaporizing capacity of 16-100 gallons per hour;

(c) Fifty feet for vaporizers with a vaporizing capacity over 100 gallons per hour.

(12) Direct fired vaporizers must not raise the product pressure above the design pressure of the vaporizer equipment or above the pressure shown in the second column of Table U-8.

(13) Fusible plugs are prohibited on vaporizers.

(14) Vaporizers must not have unprotected drains to sewers or sump pits.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41031, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41031, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060. 96-22-048, § 296-306A-41031, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41033 How must direct gas-fired tank heaters be constructed and installed?** Direct gas-fired tank heaters must be constructed and installed as follows:

(1) Direct gas-fired tank heaters, and tanks to which they are applied, must only be installed aboveground.

(2) Tank heaters must be permanently marked with the name of the manufacturer, the rated Btu input to the burner, and the maximum vaporizing capacity in gallons per hour.

Note: Tank heaters may be an integral part of a fuel storage container directly connected to the container liquid section, or vapor section, or both.

(3) Tank heaters must have a means for manually turning off the gas to the main burner and pilot.

(4) Tank heaters must have an automatic safety device to shut off the flow of gas to main burners, if the pilot light should fail. When flow through pilot exceeds 2,000 Btu per hour, the pilot also must have an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(5) Pressure regulating and pressure reducing equipment if located within ten feet of a direct fired tank heater must be separated from the open flame by a substantially airtight non-combustible partition.

(6) The following minimum distances must be maintained between a storage tank heated by a direct fired tank heater and the nearest important building, group of buildings, or line of adjoining property that may be built on:

(a) Ten feet for storage containers of less than 500 gallons water capacity;

(b) Twenty-five feet for storage containers of 500-1,200 gallons water capacity;

(c) Fifty feet for storage containers of over 1,200 gallons water capacity.

(7) No direct fired tank heater may raise the product pressure within the storage container over 75% of the pressure in the second column of Table U-8.

[97-09-013, recodified as § 296-307-41033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41035 How must dehydrators be constructed and installed?** The vaporizer section of vaporizer-burners used for dehydrators or dryers must be located outdoors; they must be constructed and installed as follows:

(1) Vaporizer-burners must have a minimum design pressure of 250 psig with a factor safety of five.

(2) Manually operated positive shut-off valves must be located at the containers to shut off all flow to the vaporizer-burners.

(3) Minimum distances between storage containers and vaporizer-burners must be as follows:

Water capacity per container (gallons)	Minimum distances (feet)
Less than 501	10
501 to 2,000	25
Over 2,000	50

(4) The vaporizer section of vaporizer-burners must be protected by a hydrostatic relief valve. The relief valve must be located where it is not subjected to temperatures over 140°F. The start-to-discharge pressure setting must protect the components involved, and be at least 250 psig. The discharge must be directed upward and away from component parts of the equipment and away from operating personnel.

(5) Vaporizer-burners must have means for manually turning off the gas to the main burner and pilot.

(6) Vaporizer-burners must have automatic safety devices to shut off the flow of gas to the main burner and pilot in the event the pilot is extinguished.

(7) Pressure regulating and control equipment must be located or protected so that the temperatures surrounding this equipment shall not exceed 140°F.

Exception: Equipment components may be used at higher temperatures if designed to withstand such temperatures.

(8) Pressure regulating and control equipment when located downstream of the vaporizer must be designed to withstand the maximum discharge temperature of the vapor.

(9) Fusible plugs are prohibited on the vaporizer section of vaporizer-burners.

(10) Vaporizer coils or jackets must be made of ferrous metal or high temperature alloys.

(11) Equipment utilizing vaporizer-burners must have automatic shutoff devices upstream and downstream of the vaporizer section connected so as to operate in the event of excessive temperature, flame failure, and, if applicable, insufficient airflow.

[97-09-013, recodified as § 296-307-41035, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41035, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41037 What are the maximum filling densities?** (1) "Filling density" means the percent ratio of the weight of the gas in a container to the weight of water the container will hold at 60°F. All containers shall be filled according to the filling densities shown in Table U-4.

**TABLE U-4  
MAXIMUM PERMITTED FILLING DENSITY**  
Aboveground containers

Specific Gravity at 60°F (15.6°C)	0 to 1,200 U.S. gals. (1,000 imp. gal. 4,500 liters) total water cap	0 to 1,200 U.S. gals. (1,000 imp. gal. 4,500 liters) total water cap	Underground containers, all capacities
	Percent	Percent	
.496-.503	41	44	45
.504-.510	42	45	46
.511-.519	43	46	47
.520-.527	44	47	48
.528-.536	45	48	49
.537-.544	46	49	50
.545-.552	47	50	51
.553-.560	48	51	52
.561-.568	49	52	53
.569-.576	50	53	54
.577-.584	51	54	55
.585-.592	52	55	56
.593-.600	53	56	57

(2) Any container including mobile cargo tanks and portable tank containers regardless of size or construction, shipped under DOT jurisdiction or constructed according to DOT specifications must be charged according to DOT requirements.

(3) Exception: Portable containers not subject to DOT jurisdiction must be filled either by weight, or by volume using a fixed length dip tube gauging device.

[97-09-013, recodified as § 296-307-41037, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41037, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41039 What requirements apply to LP-gas in buildings?** (1) Vapor may be piped into buildings at pressures over 20 psig only if the buildings or separate areas thereof:

(a) Are constructed according to this section;

(b) Are used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard;

(c) Are buildings, structures, or equipment under construction or undergoing major renovation.

(2) Liquid may be permitted in buildings as follows:

(a) In buildings, or separate areas of buildings, used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard; and when such buildings, or separate areas are constructed according to this section.

(b) In buildings, structures, or equipment under construction or undergoing major renovation if the temporary piping meets the following conditions:

(i) Liquid piping inside the building meets the requirements of WAC 296-307-41021 and is a maximum of three-fourths iron pipe size. Copper tubing with an outside diameter of 3/4 inch or less may be used if it meets the requirements of Type K of Specifications for Seamless Water Tube, ANSI H23.1-1970 (ASTM B88-1969). (See Table U-2.) All such piping must be protected against construction hazards. Liquid piping inside buildings must be kept to a minimum. Such piping must be securely fastened to walls or other surfaces to provide adequate protection from breakage and located to subject the liquid line to the lowest ambient temperatures.

(ii) A shut-off valve must be installed in each intermediate branch line where it takes off the main line and must be readily accessible. A shut-off valve must also be placed at the appliance end of the intermediate branch line. Such shut-off valve must be upstream of any flexible connector used with the appliance.

(iii) Suitable excess flow valves must be installed in the container outlet line supplying liquid LP-gas to the building. A suitable excess flow valve must be installed immediately downstream of each shut-off valve. Excess flow valves must be installed where piping size is reduced and must be sized appropriately.

(iv) Hydrostatic relief valves must be installed according to WAC 296-307-41025(13).

(v) Using hose to carry liquid between the container and the building or at any point in the liquid line, except at the appliance connector, is prohibited.

(vi) Where flexible connectors are necessary for appliance installation, such connectors must be as short as practical and must meet the requirements of WAC 296-307-41021(4) or 296-307-41023.

(vii) Release of fuel when any section of piping or appliances is disconnected must be minimized by either of the following methods:

(A) Using an approved automatic quick-closing coupling (closing in both directions when coupled in the fuel line); or

(B) Closing the valve nearest to the appliance and allowing the appliance to operate until the fuel in the line is consumed.

(viii) See WAC 296-307-41509 for the conditions under which portable containers may be brought indoors.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41039, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41039, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41039, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41041 What requirements apply to transfer of liquids?** When transferring liquids, you must ensure that:

(1) At least one attendant remains close to the transfer connection from the time the connections are first made until they are finally disconnected, during the transfer of the product.

(2) Containers must be filled or used only upon authorization of the owner.

(3) Containers manufactured according to DOT specifications authorized by DOT as a "single trip" or "nonrefillable container" must not be refilled or reused in LP-gas service.

(4) Gas or liquid must not be vented to the atmosphere to assist in transferring contents of one container to another, except as provided in WAC 296-307-42509(4). A listed pump may use LP-gas in the vapor phase as a source of energy. The gas may be vented to the atmosphere at a rate not to exceed that from a No. 31 drill size opening, if venting and liquid transfer are located at least 50 feet from the nearest important building.

(5) Filling fuel containers for industrial trucks or motor vehicles from industrial bulk storage containers must be performed at least ten feet from the nearest important masonry-walled building or at least twenty-five feet from the nearest important building or other construction and always at least 25 feet from any building opening.

(6) Filling portable containers, containers mounted on skids, fuel containers on farm tractors, or similar applications, from storage containers used in domestic or commercial service, must be performed at least 50 feet from the nearest important building.

(7) The filling connection and the vent from the liquid level gauges in containers, filled at point of installation, must be at least ten feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(8) Fuel supply containers must be gauged and charged only in the open air or in buildings especially provided for that purpose.

(9) Marketers and users must exercise precaution to ensure that only those gases for which the system is designed, examined, and listed, are employed in its operation, particularly with regard to pressures.

(10) Pumps or compressors must be designed for use with LP-gas. When compressors are used they must normally take suction from the vapor space of the container being filled and discharge to the vapor space of the container being emptied.

(11) Pumping systems, when equipped with a positive displacement pump, must include a recirculating device that limits the differential pressure on the pump under normal operating conditions to the maximum differential pressure rating of the pump. The discharge of the pumping system must be protected so that pressure is a maximum of 350 psig. If a recirculation system discharges into the supply tank and contains a manual shut-off valve, an adequate secondary safety recirculation system must be incorporated that has no means of rendering it inoperative. Manual shut-off valves in recirculation systems must be kept open except during an emergency or when repairs are being made to the system.

(12) When necessary, unloading piping or hoses must have suitable bleeder valves for relieving pressure before disconnection.

(13) Agricultural air moving equipment, including crop dryers, shall be shut down when supply containers are filling unless the air intakes and sources of ignition on the equipment are located 50 feet or more from the container.

(14) Agricultural equipment employing open flames or equipment with integral containers, such as flame cultivators, weed burners, and tractors, must be shut down during refueling.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41041, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41041, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41041, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41043 Must workers be trained?**

Workers performing installation, removal, operation, and maintenance work must be properly trained in that function.

[97-09-013, recodified as § 296-307-41043, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41043, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41045 What fire protection must be provided for LP-gas installations?** (1) Open flames or other sources of ignition are prohibited in vaporizer rooms (except those housing direct-fired vaporizers), pumphouses, container charging rooms or other similar locations. Direct-fired vaporizers are prohibited in pumphouses or container charging rooms.

Note: LP-gas storage containers do not require lightning protection. Since LP-gas is contained in a closed system of piping and equipment, the system need not be electrically conductive or electrically bonded for protection against static electricity. (See NFPA No. 77-1972-1973, Recommended Practice for Static Electricity.)

(2) Open flames (except as provided in subsection (1) of this section), cutting or welding, portable electric tools, and extension lights capable of igniting LP-gas, are prohibited within classified areas specified in Table U-5 unless the LP-gas facilities have been freed of all liquid and vapor, or special precautions observed under carefully controlled conditions.

[97-09-013, recodified as § 296-307-41045, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41045, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41047 What electrical requirements apply to LP-gas installations?** (1) Electrical equipment and wiring must be specified by and installed according to chapter 296-307 WAC Part T, for ordinary locations.

(2) Fixed electrical equipment and wiring installed within classified areas must comply with Table U-5 and must be installed according to chapter 296-307 WAC Part T.

EXCEPTION: This provision does not apply to fixed electrical equipment at residential or commercial installations of LP-gas systems, LP-gas used as a motor fuel, or to LP-gas system installations on commercial vehicles.

TABLE U-5

Part	Location	Extent of classified area <sup>1</sup>	Equipment shall be suitable for Class I, Group D <sup>2</sup>
A	Storage containers other than DOT cylinders	Within 15 feet in all directions from connections, except connections otherwise covered in this table	Division 2
B	Tank vehicle and tank car loading and unloading <sup>3</sup>	Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade (See Figure H-1)	Division 2
C	Gauge vent openings other than those on DOT cylinders	Within 5 feet in all directions from point of discharge	Division 1
		Beyond 5 feet but within 15 feet in all directions from point of discharge	Division 2
D	Relief valve discharge other than those on DOT cylinders	Within direct path of discharge	Division 1 <i>Note:</i> Fixed electrical equipment should not be installed
		Within 5 feet in all directions from point of discharge	Division 1
		Beyond 5 feet but within 15 feet in all directions from point of discharge except within the direct path of discharge	Division 2

Part	Location	Extent of classified area <sup>1</sup>	Equipment shall be suitable for Class I, Group D <sup>2</sup>
E	Pumps, compressors, gas-air mixers and vaporizers other than direct fired	Indoors without ventilation	Entire room and any adjacent room not separated by a gastight partition Division 1
		Indoors with adequate ventilation <sup>4</sup>	Entire room and any adjacent room not separated by a gastight partition Division 2
	Outdoors in open air at or above grade	Within 15 feet of the exterior side of any exterior wall or roof that is not vaportight or within 15 feet of any exterior opening	Division 2
		Within 15 feet in all directions from this equipment and within the cylindrical volume between the horizontal equator of the sphere and grade (See Figure H-1)	Division 2
F	Service station dispensing units	Entire space within dispenser enclosure, and 18 inches horizontally from enclosure exterior up to an elevation 4 ft. above dispenser base. Entire pit or open space beneath dispenser	Division 1
		Up to 18 inches above grade within 20 ft. horizontally from any edge of enclosure	Division 2
	<i>Note:</i> For pits within this area, see Part F of this table		
G	Pits or trenches containing or located beneath LP-gas valves, pumps, compressors, regulators, and similar equipment	Without mechanical ventilation	Entire pit or trench Division 1
		With adequate mechanical ventilation	Entire room and any adjacent room not separated by a gastight partition Division 2
		With adequate mechanical ventilation	Within 15 feet in all directions from pit or trench when located outdoors Division 2
	Special buildings or rooms for storage of portable containers	Entire room	Division 2
		Entire room and any adjacent room not separated by a gastight partition	Division 2
		Within 15 feet in all directions from pit or trench when located outdoors	Division 2

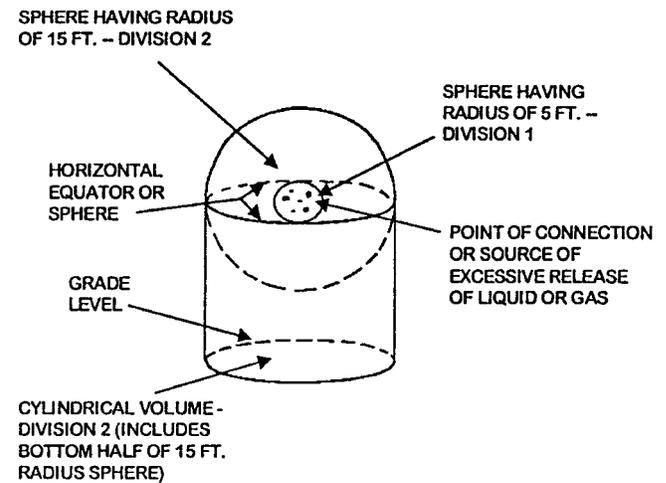
Part	Location	Extent of classified area <sup>1</sup>	Equipment shall be suitable for Class I, Group D <sup>2</sup>
I	Pipelines and connections containing operational bleeds, drips, vents or drains	Within 5 ft. in all directions from point of discharge	Division 1
		Beyond 5 ft. from point of discharge, same as Part E of this table	
J	Container filling	Indoors without ventilation	Entire room Division 1
		Indoors with adequate ventilation <sup>4</sup>	Within 5 feet in all directions from connections regularly made or disconnected for product transfer Division 1
	Outdoors in open air	Beyond 5 feet and entire room	Division 2
		Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade (See Fig. H-1.)	Division 2

<sup>1</sup>The classified area must not extend beyond an unpierced wall, roof, or solid vaportight partition.

<sup>2</sup>See chapter 296-46 WAC, and chapter 296-306A WAC Part T.

<sup>3</sup>When classifying the extent of a hazardous area, consider the possible variations in the spotting of tank cars and tank vehicles at the unloading points and the effect these variations of actual spotting point may have on the point of connection.

<sup>4</sup>Ventilation, either natural or mechanical, is considered adequate when the concentration of the gas in a gas-air mixture does not exceed twenty-five percent of the lower flammable limit under normal operating conditions.



[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41047, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41047, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41047, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41049 What requirements apply to liquid-level gauging devices?** (1) Each container manufactured after December 31, 1965, and filled on a volumetric basis must have a fixed liquid-level gauge to indicate the maximum permitted filling level according to subsection (5) of this section. Each container manufactured after December 31, 1969, must have permanently attached to the container adjacent to the fixed level gauge a marking showing the percentage full that will be shown by that gauge. When used with a variable liquid-level gauge, the fixed liquid-level gauge will act as a check on the variable gauge. Gauges must be used in charging containers as required in WAC 296-307-41034.

(2) All variable gauging devices must be arranged so that the maximum liquid level for butane, for a 50/50 mixture of butane and propane, and for propane, to which the container may be charged, is easily determined. Liquid levels from empty to full must be marked on the system nameplate or gauging device. Dials of magnetic or rotary gauges must show whether they are for cylindrical or spherical containers and whether for aboveground or underground service. The dials of gauges for aboveground containers of over 1,200 gallons water capacity must be so marked.

(3) Gauging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, shall be designed so that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with excess flow valve.

(4) Gauging devices must have a design working pressure of at least 250 psig.

(5) Length of tube or position of fixed liquid-level gauge must be designed to indicate the maximum level to which the container may be filled for the product contained. This level shall be based on the volume of the product at 40°F at its maximum permitted filling density for aboveground containers and at 50°F for underground containers. You must calculate the filling point for which the fixed liquid level gauge must be designed according to this section.

Note: It is impossible to set out in a table the length of a fixed dip tube for various tank capacities because of the various tank diameters and lengths, and because the tank may be installed either vertically or horizontally. If you know the maximum permitted filling volume in gallons, however, you can determine the length of the fixed tube by using a strapping table from the container manufacturer.

The fixed tube should be long enough so that when its lower end touches the surface of the liquid in the container, the contents of the container will be the maximum permitted volume as determined by the following formula:

$$\frac{\text{Water capacity of container}^1 \text{ (gals.)} \times \text{filling density}^2}{\text{Specific gravity of LP-gas}^3 \times \text{volume correction factor}^3 \times 100} = \text{Maximum volume of LP-gas}$$

<sup>1</sup> Measure at 60°F.

<sup>2</sup> From WAC 296-307-41037(1).

<sup>3</sup> For aboveground containers the liquid temperature is assumed to be 40°F and for underground containers the liquid temperature is assumed to be 50°F. To correct the liquid volumes at these temperatures to 60°F, use the following factors:

(a) To determine maximum volume of LP-gas for which a fixed length of dip tube must be set:

(2007 Ed.)

TABLE U-6  
VOLUME CORRECTION FACTORS

Specific gravity	Aboveground	Underground
0.500	1.033	1.017
.510	1.031	1.016
.520	1.029	1.015
.530	1.028	1.014
.540	1.026	1.013
.550	1.025	1.013
.560	1.024	1.012
.570	1.023	1.011
.580	1.021	1.011
.590	1.020	1.010

(b) To calculate the maximum volume of LP-gas that can be placed in a container when determining the length of the dip tube expressed as a percentage of total water content of the container, use the formula in (c) of this subsection.

(c) Determine the maximum weight of LP-gas that may be placed in a container for determining the length of a fixed dip tube by multiplying the maximum volume of LP-gas from Table U-6 by the pounds of LP-gas in a gallon at 40°F for aboveground and at 50°F for underground containers. Typical pounds per gallon are specified below:

Example: Assume a one hundred gallon total water capacity tank for aboveground storage of propane having a specific gravity of 0.510 of 60°F.

$$\frac{100 \text{ (gals.)} \times 42 \text{ (filling density)}}{0.510 \times 1.031 \text{ (correction factor from Table U-6)} \times 100} = \frac{4200}{52.6}$$

79.8 gallons propane, the maximum amount permitted to be placed in a 100-gallon total water capacity above ground container equipped with a fixed dip tube.

$$\frac{\text{Maximum volume of LP-gas (from formula in (a) of this subsection)} \times 100}{\text{Total water content of container in gallons}} = \text{Maximum percent of LP-gas}$$

	Aboveground, pounds per gallon	Underground, pounds per gallon
Propane	4.37	4.31
N Butane	4.97	4.92

(6) Fixed liquid-level gauges used on non-DOT containers must be stamped on the exterior of the gauge with the letters DT followed by the vertical distance (expressed in inches and carried out to one decimal place) from the top of container to the end of the dip tube or to the centerline of the gauge when located at the maximum permitted filling level. For portable containers that may be filled in the horizontal and/or vertical position the letters DT must be followed by V with the vertical distance from the top of the container to the end of the dip tube for vertical filling, and with H followed by the proper distance for horizontal filling. For DOT containers the stamping must be placed both on the exterior of the gauge and on the container. On aboveground or cargo containers where the gauges are positioned at specific levels, the marking may be specified in percent of total tank contents and the marking must be stamped on the container.

(7) Columnar gauge glasses must be restricted to charging plants where the fuel is withdrawn in the liquid phase only. They must have valves with metallic handwheels, excess flow valves, and extra-heavy glass adequately protected with a metal housing applied by the gauge manufacturer. They must be shielded against the direct rays of the sun. Columnar gauge glasses are prohibited on tank trucks, motor fuel tanks, and containers used in domestic, commercial, and industrial installations.

(8) Float gauging devices or equivalent that do not require flow for their operation and that have connections extending outside the container do not have to have excess flow valves if the piping and fittings are adequately

designed to withstand the container pressure and are properly protected against physical damage and breakage.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41049, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41049, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41049, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41051 What requirements apply to appliances?** (1) New commercial and industrial gas consuming appliances must be approved.

Exception: Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-gas and is in good condition may be used with LP-gas only after it is properly converted, adapted, and tested for performance with LP-gas before the appliance is placed in use.

(2) Unattended heaters used inside buildings for the purpose of animal or poultry production or care must have an approved automatic device designed to shut off the flow of gas to the main burners, and pilot if used, in case the flame goes out.

(3) All commercial, industrial, and agricultural appliances or equipment must be installed according to the requirements of these standards and according to the following:

(a) Domestic and commercial appliances, NFPA 54-1969, Standard for the Installation of Gas Appliances and Gas Piping.

(b) Industrial appliances, NFPA 54A-1969, Standard for the Installation of Gas Piping and Gas Equipment on Industrial Premises and Certain Other Premises.

(c) Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37-1970.

(d) Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment, NFPA 96-1970.

[97-09-013, recodified as § 296-307-41051, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41051, filed 10/31/96, effective 12/1/96.]

### WAC 296-307-415 Cylinder systems.

[97-09-013, recodified as § 296-307-415, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-415, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41501 What does this section cover?** WAC 296-307-415 applies to systems using DOT containers. Cylinder systems must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41501, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41501, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41501, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41503 What is a "cylinder system"?** A "cylinder system" includes the container base or bracket, containers, container valves, connectors, manifold valve assembly, regulators, and relief valves.

[97-09-013, recodified as § 296-307-41503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41503, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2510]

**WAC 296-307-41505 How must containers be marked for cylinder systems?** (1) Containers must be marked according to DOT regulations. Additional markings that do not conflict with DOT regulations may be used.

(2) Each container must be marked with its water capacity in pounds or other identified unit of weight.

(3) Exception: If you are the only one who fills and maintains the container and if the water capacity of the container is identified by a code, subsection (2) of this section does not apply.

(4) Each container must be marked with its tare weight in pounds or other identified unit of weight including all permanently attached fittings but not the cap.

[97-09-013, recodified as § 296-307-41505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41505, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41507 What additional requirements apply to cylinder systems installed outdoors?** (1) Containers must not be buried below ground. However, systems may be installed in a compartment or recess below grade level,

such as a niche in a slope or terrace wall that is used for no other purpose, if the container and regulating equipment are not in contact with the ground, and the compartment or recess is drained and ventilated horizontally to the outside air from its lowest level, with the outlet at least 3 feet away from any building opening below the level of the outlet.

(2) Except as provided in WAC 296-307-41025(14), the discharge from safety-relief devices must be located at least three feet away from any building opening that is below the level of discharge and must not terminate beneath any building unless the space is well ventilated to the outside and is not enclosed on more than two sides.

(3) Containers must be set on firm foundation or otherwise firmly secured; the possible effect of settling on the outlet piping must be guarded against by a flexible connection or special fitting.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41507, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41507, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41507, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41509 What additional requirements apply to cylinder system installed indoors?** (1) When portable containers are necessary and it is not practical to use them outdoors, containers and equipment may be used indoors only if they meet the requirements of this section.

(a) "Containers in use" means connected for use.

(b) Systems using containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must have excess flow valves. Such excess flow valves must be either integral with the container valves or in the connections to the container valve outlets. In either case, an excess flow valve must be installed so that any strain beyond the excess flow valve will not cause breakage between the container and the excess flow valve. The installation of excess flow valves must take into account the type of valve protection provided.

(c) Regulators must be either directly connected to the container valves or to manifolds connected to the container valves. The regulator must be suitable for use with LP-gas.

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Manifolds and fittings connecting containers to pressure regulator inlets must be designed for at least 250 psig service pressure.

(d) Valves on containers having a water capacity greater than fifty pounds (nominal twenty pounds LP-gas capacity) must be protected while in use.

(e) Aluminum pipe or tubing is prohibited.

(f) Hose must be designed for a working pressure of at least 250 psig. Hose and hose connections shall be listed by a nationally recognized testing laboratory.

(i) Hose must be as short as practical.

(ii) Hose must be long enough to allow required spacing without kinking, straining, or allowing hose to be close enough to a burner to be damaged by heat.

(g) Portable heaters, including salamanders, must have an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in case the flame goes out. Heaters with inputs above 50,000 Btu manufactured on or after May 17, 1967, and heaters with inputs above 100,000 Btu manufactured before May 17, 1967, must have either:

(i) A pilot that must be lighted and proved before the main burner can be turned on; or

(ii) An electric ignition system;

(iii) Container valves, connectors, regulators, manifolds, piping, and tubing must not be used as structural supports for heaters.

Exception: These requirements do not apply to tar kettle burners, torches, melting pots, nor do they apply to portable heaters under 7,500 Btu/h input when used with containers with a maximum water capacity of 2-1/2 pounds.

(h) Containers, regulating equipment, manifolds, piping, tubing, and hose must be located to minimize exposure to abnormally high temperatures (such as may result from exposure to convection or radiation from heating equipment or installation in confined spaces), physical damage, or tampering.

(i) Heat producing equipment must be located and used to minimize the possibility of igniting combustibles.

(j) Containers with water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) connected for use, must stand on a firm and substantially level surface and, when necessary, must be secured in an upright position.

(k) Containers, including the valve protective devices, must be installed to minimize the probability of impingement of discharge of safety-relief devices upon containers.

(2) Containers with a maximum water capacity of 2-1/2 pounds (nominal one pound LP-gas capacity) may be used indoors as part of approved self-contained hand torch assemblies or similar appliances.

(3) When buildings frequented by the public are open to the public, containers may be used for repair or minor renovation as follows:

(a) The maximum water capacity of individual containers must be 50 pounds (nominal twenty pounds LP-gas capacity).

(b) The number of LP-gas containers must not exceed the number of employees assigned to use LP-gas.

(c) Containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must be attended at all times.

(4) When buildings frequented by the public are closed to the public, containers may be used in buildings or structures for repairs or minor renovation as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity).

(b) For temporary heating such as curing concrete, drying plaster and similar applications, heaters (other than integral heater-container units) must be located at least six feet from any LP-gas container. You may use heaters specifically designed for attachment to the container or to a supporting standard, if they are designed and installed to prevent direct or radiant heat application from the heater onto the container. Blower and radiant type heater must not be directed toward any LP-gas container within 20 feet.

(c) If two or more heater-container units are located in an unpartitioned area on the same floor, the container or containers of each unit must be separated from the container or containers of any other unit by at least 20 feet.

(d) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers manifolded together for connection to a heater or heaters shall not be greater than 735 pounds (nominal three hundred pounds LP-gas capacity). Such manifolds must be separated by at least 20 feet.

(e) On floors on which heaters are not connected for use, containers may be manifolded together for connection to a heater or heaters on another floor, if:

(i) The total water capacity of containers connected to any one manifold is a maximum of 2,450 pounds (nominal one thousand pounds LP-gas capacity) and;

(ii) Where more than one manifold having a total water capacity greater than 735 pounds (nominal three hundred pounds LP-gas capacity) are located in the same unpartitioned area, they shall be separated by at least 50 feet.

(f) Containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must be attended at all times.

(5) Containers may be used in industrial occupancies for processing, research, or experimental purposes as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity).

(b) Containers connected to a manifold must have a total water capacity of a maximum of 735 pounds (nominal three hundred pounds LP-gas capacity) and only one manifold may be located in the same room unless separated at least 20 feet from a similar unit.

(c) LP-gas in containers for research and experimental use must use the smallest practical quantity.

(6) Containers used in industrial occupancies with essentially noncombustible contents where portable equipment for space heating is essential and where a permanent heating installation is not practical, must meet the requirements of subsection (5) of this section.

(7) Containers may be used in buildings for temporary emergency heating purposes, if necessary to prevent damage to the buildings or contents, when the permanent heating system is temporarily out of service, as follows:

(a) Containers and heaters must meet the requirements of subsection (5) of this section.

(b) The temporary heating equipment must be attended at all times.

(8) Containers may be used temporarily in buildings for training purposes related in installation and use of LP-gas systems, as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity), but the maximum quantity of LP-gas that may be placed in each container is 20 pounds.

(b) If more than one container is located in the same room, the containers must be separated by at least 20 feet.

(c) Containers must be removed from the building when the training class has terminated.

[97-09-013, recodified as § 296-307-41509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41509, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41511 What requirements apply to valves and accessories?** (1) Valves in the assembly of multiple container systems must be arranged so that containers can be replaced without shutting off the flow of gas in the system.

Note: An automatic changeover device is not required.

(2) Regulators and low-pressure relief devices must be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls or otherwise rigidly secured and must be installed or protected so that weather will not affect their operation.

(3) Valves and connections to the containers must be protected while in transit, in storage, and while being moved into final use, as follows:

(a) By setting into the recess of the container to prevent the possibility of being struck if the container is dropped on a flat surface; or

(b) By ventilated cap or collar, fastened to the container capable of withstanding a blow from any direction equivalent to that of a 30-pound weight dropped four feet. Construction must ensure that a blow will not be transmitted to the valve or other connection.

(4) When containers are not connected to the system, the outlet valves must be kept tightly closed or plugged, even on empty containers.

(5) Containers having a water capacity in excess of 50 pounds (approximately 21 pounds LP-gas capacity), recharged at the installation, must have excess flow or back-flow check valves to prevent the discharge of container contents in case of failure of the filling or equalizing connection.

[97-09-013, recodified as § 296-307-41511, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41511, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41513 What requirements apply to safety devices for cylinder systems?** (1) Containers must have safety devices as required by DOT regulations.

(2) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

TABLE U-7

**Relief valve start-to-discharge pressure setting (percent of regulator delivery pressure)**

<b>Regulator delivery pressure</b>	<b>Minimum</b>	<b>Maximum</b>
1 psig or less	200	300
Above 1 psig but not over 3 psig	140	200
Above 3 psig	125	200

(3) When a regulator or pressure relief valve is used indoors for other than purposes specified in WAC 296-307-41017(1), the relief valve and the space above the regulator and relief valve diaphragms shall be vented to the outside air with the discharge outlet located at least three feet horizontally away from any building opening that is below such discharge.

Exception: This requirement does not apply to individual appliance regulators when protection is otherwise provided, nor to WAC 296-307-41509 and 296-307-41025(14). In buildings devoted exclusively to gas distribution, the space above the diaphragm need not be vented to the outside.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-41513, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-41513, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41513, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-41515 What other requirements apply to cylinder systems?** (1) Containers must not be reinstalled unless they are requalified according to DOT regulations.

(2) A product must not be placed in a container marked with a service pressure less than four-fifths of the maximum vapor pressure of product at 130°F.

[97-09-013, recodified as § 296-307-41515, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41515, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-420 Systems using non-DOT containers.**

[97-09-013, recodified as § 296-307-420, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-420, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42001 What does this section cover?** WAC 296-307-420 applies to systems using storage containers not constructed according to DOT specifications. Non-DOT containers must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-42001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42003 How must non-DOT containers be designed and classified?** Storage containers must be designed and classified according to Table U-8.

**TABLE U-8**  
**Minimum design pressures of**  
**container lb. per sq. in. gauge**

Container type	For gases with vapor press. Not to exceed lb. per sq. in. gauge 100°F (37.8°C.)	1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code <sup>3</sup>
80 <sup>1</sup>	80 <sup>1</sup>	80 <sup>1</sup>	100 <sup>1</sup>
100	100	100	125
125	125	125	156
150	150	150	187
175	175	175	219
200 <sup>2</sup>	215	200	250

<sup>1</sup>New type 80 storage containers have not been authorized since Dec. 31, 1947.

<sup>2</sup>Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designations when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under:

1. The 1949 ASME Code (Par. U-200 and U-201);
2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code; and
3. All editions of the API-ASME Code.

<sup>3</sup>Construction of containers under the API-ASME Code is prohibited after July 1, 1961.

[97-09-013, recodified as § 296-307-42003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42005 What requirements apply to valves and accessories, filler pipes, and discharge pipes for non-DOT containers?** (1) The filling pipe inlet terminal must not be located inside a building. For containers with a water capacity of 125 gallons or more, such terminals must be located at least 10 feet from any building, and preferably at least 5 feet from any driveway, and must have a protective housing.

(2) The filling connection must be fitted with one of the following:

- (a) Combination back-pressure check valve and excess flow valve.
- (b) One double or two single back-pressure check valves.
- (c) A positive shut-off valve in conjunction with either:
  - (i) An internal back pressure valve; or
  - (ii) An internal excess flow valve.

(3) All openings in a container must have approved automatic excess flow valves unless otherwise exempt.

(4) An excess flow valve is not required in the withdrawal service line if the following requirements are met:

- (a) The total water capacity is a maximum of 2,000 U.S. gallons.
- (b) The discharge from the service outlet is controlled by a manually operated shut-off valve that is:
  - (i) Threaded directly into the service outlet of the container; or
  - (ii) Is an integral part of a substantial fitting threaded into or on the service outlet of the container; or

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(ii) Threaded directly into a substantial fitting threaded into or on the service outlet of the container.

(c) The shut-off valve is equipped with an attached hand-wheel or the equivalent.

(d) The controlling orifice between the contents of the container and the outlet of the shut-off valve is a maximum of 5/16 inch in diameter for vapor withdrawal systems and 1/8 inch in diameter for liquid withdrawal systems.

(e) An approved pressure-reducing regulator is directly attached to the outlet of the shut-off valve and is rigidly supported, or an approved pressure-reducing regulator is attached to the outlet of the shut-off valve by means of a suitable flexible connection, if the regulator is adequately supported and properly protected on or at the tank.

(5) All inlet and outlet connections except safety-relief valves, liquid-level gauging devices and pressure gauges on containers of 2,000 gallons water capacity, or more, and on any container used to supply fuel directly to an internal combustion engine, must be labeled to designate whether they communicate with vapor or liquid space. Labels may be on valves.

(6) Instead of an excess flow valve, openings may be fitted with a quick-closing internal valve that must remain closed when not in operation. The internal mechanism for such valves may have a secondary control that must have a fusible plug (not over 220°F melting point) that will cause the internal valve to close automatically in case of fire.

(7) A maximum of two plugged openings may be used on a container of 2,000 gallons or less water capacity.

(8) Containers of 125 gallons water capacity or more manufactured after July 1, 1961, must have an approved device for liquid evacuation, the size of which must be 3/4 inch national pipe thread minimum. A plugged opening does not satisfy this requirement.

[97-09-013, recodified as § 296-307-42005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42007 What additional requirements apply to safety devices for non-DOT containers?** (1) All safety devices must comply with the following:

(a) All container safety-relief devices must be located on the containers.

(b) In industrial and gas manufacturing plants, discharge pipe from safety-relief valves on pipe lines within a building must discharge upward and be piped to a point outside a building.

(c) Safety-relief device discharge terminals must be located to provide protection against physical damage and must be fitted with loose raincaps. Return bends and restrictive pipefittings are prohibited.

(d) If desired, discharge lines from two or more safety-relief devices located on the same unit, or similar lines from two or more different units, may be run into a common discharge header, if the cross-sectional area of the header is at least equal to the sum of the cross-sectional area of the individual discharge lines, and the setting of safety-relief valves are the same.

(e) Each storage container of over 2,000 gallons water capacity must have a suitable pressure gauge.

(f) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

(g) When a regulator or pressure relief valve is installed indoors, the relief valve and the space above the regulator and relief valve diaphragms must be vented to the outside air with the discharge outlet located not less than 3 feet horizontally away from any opening into the building that is below such discharge.

Exception: This requirement does not apply to individual appliance regulators already protected. In buildings devoted exclusively to gas distribution, the space above the diaphragm need not be vented to the outside.

(2) Safety devices for aboveground containers must be provided as follows:

(a) Containers of 1,200 gallons water capacity or less that may contain liquid fuel when installed aboveground must have the rate of discharge required by WAC 296-307-41025(2) provided by a spring-loaded relief valve or valves. In addition to the required spring-loaded relief valve, a suitable fuse plug may be used if the total discharge area of the fuse plug for each container does not exceed 0.25 square inch.

(b) The fusible metal of the fuse plugs must have a yield temperature of 208°F minimum and 220°F maximum. Relief valves and fuse plugs must have direct communication with the vapor space of the container.

(c) On a container having a water capacity between 125 and 2,000 gallons, the discharge from the safety-relief valves must be vented away from the container upwards and unobstructed to the open air so that it prevents any impingement of escaping gas upon the container; loose-fitting rain caps shall be used. Suitable provision must be made for draining condensate that may accumulate in the relief valve or its discharge pipe.

(d) On containers of 125 gallons water capacity or less, the discharge from safety-relief devices must be located at least 5 feet horizontally away from any opening into the building below the level of such discharge.

(e) On a container having a water capacity greater than 2,000 gallons, the discharge from the safety-relief valves must be vented away from the container upwards to a point at least 7 feet above the container, and unobstructed to the open air so that it prevents any impingement of escaping gas upon the container; loose-fitting rain caps shall be used. Suitable provision must be made so that any liquid or condensate that may accumulate inside of the safety-relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, the container, adjacent containers, piping, or equipment must be protected against impingement of flame resulting from ignition of product escaping from the drain.

(3) On all containers that are installed underground and that contain no liquid fuel until buried and covered, the rate of discharge of the spring-loaded relief valve installed thereon may be reduced to a minimum of 30% of the rate of discharge specified in WAC 296-307-41025(2). Containers so protected must remain covered after installation until the liquid fuel has been removed. Containers that may contain liquid fuel before being installed underground and before being completely covered with earth are aboveground containers

when determining the rate of discharge requirement of the relief valves.

(4) On underground containers of over 2,000 gallons water capacity, the discharge from safety-relief devices must be piped directly upward to a point at least 7 feet above the ground.

(5) Where the manhole or housing may become flooded, the discharge from regulator vent lines must be above the highest probable water level. All manholes or housings must have ventilated louvers or equivalent, and the area of openings must be equal to or exceed the combined discharge areas of the safety-relief valves and other vent lines that discharge their content into the manhole housing.

(6) Safety devices for vaporizers must be provided as follows:

(a) Vaporizers of less than 1 quart total capacity, heated by the ground or the surrounding air, need not have safety-relief valves if adequate tests demonstrate that the assembly is safe without safety-relief valves.

(b) Fusible plugs are prohibited on vaporizers.

(c) In industrial and gas manufacturing plants, safety-relief valves on vaporizers within a building must be piped to a point outside the building and be discharged upward.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42007, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42009 When may non-DOT containers be reinstalled?** Containers may be reinstalled if they are free from harmful external corrosion or other damage. Where containers are reinstalled underground, the corrosion resistant coating must be put in good condition. Where containers are reinstalled aboveground, the safety devices and gauging devices must meet all requirements for aboveground containers.

[97-09-013, recodified as § 296-307-42009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42011 What is the maximum capacity allowed for non-DOT containers?** A non-DOT storage container must have a maximum 90,000 gallons water capacity.

[97-09-013, recodified as § 296-307-42011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42013 How must non-DOT containers be installed?** (1) Containers installed aboveground must have substantial masonry or noncombustible structural supports on firm masonry foundation, unless otherwise indicated.

(2) Aboveground containers must be supported as follows:

(a) Horizontal containers must be mounted on saddles that permit expansion and contraction. Structural metal supports may be used when they are protected against fire. Suitable means of preventing corrosion must be provided on that portion of the container in contact with the foundations or saddles.

(b) Containers of 2,000 gallons water capacity or less may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container shell to the concrete pad, footing, or the ground is a maximum of 24 inches.

(3) Any container may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container to the ground is a maximum of 5 feet, if the container is in an isolated location.

(4) Partially buried containers must meet the following requirements:

(a) The portion of the container below the surface and for a vertical distance not less than 3 inches above the surface of the ground is protected to resist corrosion, and the container is protected against settling and corrosion as required for fully buried containers.

(b) Partially buried containers must meet the same spacing requirements as underground tanks.

(c) Relief valve capacity must be the same as for above-ground containers.

(d) Container is protected against vehicular damage by location or other means.

(e) Partially buried containers must meet the same requirements for filling densities as for aboveground containers.

(5) Containers buried underground must be placed so that the top of the container is at least 6 inches below grade. Underground containers subject to abrasive action or physical damage must be:

(a) Placed not less than 2 feet below grade; or

(b) Otherwise protected against such physical damage.

It is not necessary to cover the portion of the container to which manhole and other connections are affixed. When necessary to prevent floating, containers must be securely anchored or weighted.

(6) Containers must be given a protective coating before being placed underground. This coating must be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. In lowering the container into place, take care to prevent damage to the coating. Any damage to the coating must be repaired before backfilling.

Containers must be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(7) Containers with foundations attached (portable or semiportable containers with suitable steel runners or skids popularly known as "skid tanks") must meet the requirements of WAC 296-307-410 and the following:

(a) If they are to be used at a given general location for a temporary period of 6 months at most, they may be without fire-resisting foundations or saddles but must have adequate ferrous metal supports.

(b) They must not be located with the outside bottom of the container shell more than 5 feet above the surface of the ground unless fire-resisting supports are provided.

(c) The bottom of the skids must be between 2 and 12 inches below the outside bottom of the container shell.

(d) Flanges, nozzles, valves, fittings, and the like, having communication with the interior of the container, must be protected against physical damage.

(e) When not permanently located on fire-resisting foundations, piping connections must be flexible enough to minimize breakage or leakage of connections if the container settles, moves, or is otherwise displaced.

(f) Skids, or lugs for attachment of skids, must be secured to the container according to the rules under which the container is designed and built (with a minimum factor of safety of four) to withstand loading in any direction equal to four times the weight of the container and attachments when filled to the maximum permissible loaded weight.

(8) Field welding where necessary must be made only on saddle plates or brackets that were applied by the manufacturer of the tank.

(9) For aboveground containers, secure anchorage or adequate pier height must be provided against possible container flotation wherever high floodwater might occur.

(10) When permanently installed containers are interconnected, you must allow for expansion, contraction, vibration, and settling of containers, and interconnecting piping. Where flexible connections are used, they must be approved and designed for a bursting pressure of at least five times the vapor pressure of the product at 100°F. Nonmetallic hose is prohibited for permanently interconnecting containers.

(11) Container assemblies listed for interchangeable installation aboveground or underground must meet the requirements for aboveground installations for safety-relief capacity and filling density. For installation aboveground all other requirements for aboveground installations apply. For installation underground all other requirements for underground installations apply.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42013, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42015 How must non-DOT containers be protected?** (1) Valves, regulating, gauging, and other container accessory equipment must be protected against tampering and physical damage. Such accessories must also be protected during the transit of containers intended for installation underground.

(2) On underground or combination aboveground-underground containers, the service valve handwheel, the terminal for connecting the hose, and the opening through which there can be a flow from safety-relief valves must be at least 4 inches above the container and this opening must be located in the dome or housing. Underground systems must be installed so that all openings, including the regulator vent, are located above the normal maximum water table.

(3) All connections to the underground containers must be located within a substantial dome, housing, or manhole, with access protected by a substantial cover.

[97-09-013, recodified as § 296-307-42015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42017 What requirements apply to non-DOT containers in industrial plants?** General provisions applicable to systems in industrial plants (of 2,000 gallons water capacity and more) and to bulk filling plants.

(1) When standard watch service is provided, it must be extended to the LP-gas installation and personnel shall be properly trained.

(2) If loading and unloading are normally done during the night, adequate lights must be provided to illuminate storage containers, control valves, and other equipment.

(3) Suitable roadways or means of access for extinguishing equipment such as wheeled extinguishers or fire department apparatus must be provided.

(4) To minimize trespassing or tampering, the area that includes container accessories, pumping equipment, loading and unloading facilities, and cylinder-filling facilities must be enclosed with at least a 6-foot-high industrial fence unless otherwise adequately protected. There must be at least two means of emergency access.

[97-09-013, recodified as § 296-307-42017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42019 What requirements apply to container-charging plants?** (1) The container-charging room must be located at least:

(a) Ten feet from bulk storage containers.

(b) Twenty-five feet from line of adjoining property that may be built on.

(2) Tank truck filling station outlets must be located at least:

(a) Twenty-five feet from line of adjoining property that may be built on.

(b) Ten feet from pumps and compressors if housed in one or more separate buildings.

(3) The pumps or compressors may be located in the container-charging room or building, in a separate building, or outside of buildings. When housed in separate building, such building (a small noncombustible weather cover is not to be construed as a building) must be located at least:

(a) Ten feet from bulk storage tanks.

(b) Twenty-five feet from line of adjoining property that may be built on.

(c) Twenty-five feet from sources of ignition.

(4) When a part of the container-charging building is to be used for a boiler room or where open flames or similar sources of ignition exist or are employed, the space to be occupied must be separated from container charging room by a partition wall or walls of fire-resistant construction continuous from floor to roof or ceiling. Such separation walls must be without openings and must be joined to the floor, other walls, and ceiling or roof to provide a permanent gas-tight joint.

[97-09-013, recodified as § 296-307-42019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42019, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42021 What fire protection must be provided for non-DOT containers?** (1) Each bulk plant must have at least one approved portable fire extinguisher with a minimum rating of 12-B, C.

[Title 296 WAC—p. 2516]

(2) In industrial installations involving containers of 150,000 gallons aggregate water capacity or more, you must provide an adequate supply of water at the container site for fire protection in the container area, unless other adequate means for fire control are provided. Water hydrants must be readily accessible and spaced to provide water protection for all containers. Enough firehose must be provided to facilitate easy movement of the hose in the container area. You should equip the outlet of each hose line with a combination fog nozzle. A shelter must be provided to protect the hose and its conveyor from the weather.

[97-09-013, recodified as § 296-307-42021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42023 What other requirements apply to non-DOT containers?** (1) Aboveground containers must be kept properly painted.

(2) Vaporizers for internal combustion engines must meet the requirements of WAC 296-307-42515.

(3) Gas regulating and mixing equipment for internal combustion engines must meet the requirements of WAC 296-307-42517.

(4) Where vaporized gas on the low-pressure side of the system may condense to a liquid at normal operating temperatures and pressures, means must be provided to revaporize condensate.

(5) You must protect LP-gas systems against damage from vehicular traffic.

(6) Avoid the use of pits when possible, except pits fitted with automatic flammable vapor detecting devices. No drains or blowoff lines must be directed into or in proximity to sewer systems used for other purposes.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-42023, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42023, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-425 LP-gas as a motor fuel.**

[97-09-013, recodified as § 296-307-425, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-425, filed 10/31/96, effective 12/1/96.]

#### **WAC 296-307-42501 What does this section cover?**

(1) WAC 296-307-425 applies to internal combustion engines, fuel containers, and pertinent equipment for the use of LP-gases as a motor fuel on easily movable, readily portable units including self-propelled vehicles. This section does not apply to containers for transportation of LP-gases nor to marine fuel use.

(2) All uses of LP-gas as a motor fuel must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-42501, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42501, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42501, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42503 What general requirements apply to LP-gas used as a motor fuel?** (1) Fuel may be used

(2007 Ed.)

from the cargo tank of a truck while in transit, but not from cargo tanks on trailers or semitrailers. Fuel may be used from the cargo tanks to operate stationary engines if the wheels are securely blocked.

(2) Passenger-carrying vehicles must not be fueled while passengers are on board.

(3) Industrial trucks (including lift trucks) equipped with permanently mounted fuel containers must be charged outdoors. Charging equipment must meet the requirements of WAC 296-307-440.

(4) LP-gas fueled industrial trucks must comply with the Standard for Type Designations, Areas of Use, Maintenance and Operation of Powered Industrial Trucks, NFPA 505-1969.

(5) Engines on vehicles must be shut down while fueling if the fueling operation involves venting to the atmosphere.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42503, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42505 How must fuel containers be designed and classified?** (1) Containers must meet the following requirements:

Minimum design pressure of container lb. per sp. in. gauge

Container type	For gases with vapor press. Not per sp. in. gauge at 100°F (37.8°C.)	1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par. U-200, U-201); editions 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code <sup>2</sup>
	200 <sup>1</sup>	215	200
			250

<sup>1</sup>Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designation when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under:

1. The 1949 ASME Code (Par. U-200 and U-201);
2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code; and
3. All editions of the API-ASME Code.

<sup>2</sup>Construction of containers under the API-ASME Code is prohibited after July 1, 1961.

Exception: Fuel containers for use in industrial trucks (including lift trucks) shall be either DOT containers authorized for LP-gas service having a minimum service pressure of 240 psig or minimum Container Type 250. Under 1950 and later ASME Codes, this means a 312.5-psig design pressure container.

(2) DOT containers used as fuel containers must meet all requirements of this section.

(3) All container inlets and outlets except safety-relief valves and gauging devices must be labeled to designate whether they communicate with vapor or liquid space. (Labels may be on valves.)

[97-09-013, recodified as § 296-307-42505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42505, filed 10/31/96, effective 12/1/96.]

(2007 Ed.)

**WAC 296-307-42507 How must fuel containers be installed?** (1) Containers must be located to minimize the possibility of damage to the container. Containers located in the rear of trucks and buses, when protected by substantial bumpers meet this requirement. Fuel containers on passenger-carrying vehicles must be installed as far from the engine as is practical, and the passenger space and any space containing radio equipment must be sealed from the container space to prevent direct seepage of gas to these spaces. The container compartment must be vented to the outside. In case the fuel container is mounted near the engine or the exhaust system, the container must be shielded against direct heat radiation.

(2) Containers must be installed with as much clearance as practical and at least the minimum road clearance of the vehicle under maximum spring deflection. This minimum clearance must be to the bottom of the container or to the lowest fitting on the container or housing, whichever is lower.

(3) Permanent and removable fuel containers must be securely mounted to prevent jarring loose, slipping, or rotating, and the fastenings must be designed and constructed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with fuel using a safety factor of at least four based on the ultimate strength of the material to be used. Field welding, when necessary, must be made only on saddle plates, lugs or brackets, attached to the container by the manufacturer.

(4) Fuel containers on buses must be permanently installed.

(5) Containers from which only vapor is to be withdrawn must be installed and equipped with suitable connections to minimize the accidental withdrawal of liquid.

[97-09-013, recodified as § 296-307-42507, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42507, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42509 What requirements apply to valves and accessories?** (1) Container valves and accessories must have a rated working pressure of at least 250 psig, and must be suitable for LP-gas service.

(2) The filling connection must be fitted with an approved double back-pressure check valve, or a positive shutoff in conjunction with an internal back-pressure check valve. On a removable container the filler valve may be a hand operated shut-off valve with an internal excess flow valve. Main shut-off valves on the container on liquid and vapor must be readily accessible.

(3) Filling connections equipped with approved automatic back-pressure check valves, and safety-relief valves, all connections to the containers having openings for the flow of gas in excess of a No. 54 drill size must have approved automatic excess flow valves to prevent discharge of content in case connections are broken.

(4) Liquid-level gauging devices must meet the following requirements:

(a) Variable liquid-level gauges that require the venting of fuel to the atmosphere are prohibited on fuel containers of industrial trucks (including lift trucks).

(b) On portable containers that may be filled in the vertical and/or horizontal position, the fixed liquid-level gauge must indicate maximum permitted filling level for both verti-

cal and horizontal filling with the container oriented to place the safety-relief valve in communication with the vapor space.

(c) For containers used solely in farm tractor service and charged at a point at least 50 feet from any important building, the fixed liquid-level gauging device may be constructed so that the outward flow of container content exceeds that passed by a No. 54 drill size opening, but must never exceed that passed by a No. 31 drill-size opening. An excess flow valve is not required. Fittings equipped with restricted drill size opening and the container on which they are used must be marked to indicate the size of the opening.

(d) All valves and connections on containers must be adequately protected to prevent damage due to accidental contact with stationary objects or from loose objects thrown up from the road. All valves must be safeguarded against damage due to collision, overturning or other accident. Farm tractors where parts of the vehicle provide protection to valves and fittings meet this requirement. However, on removable type containers the protection for the fittings must be permanently attached to the container.

(e) You should normally exchange removable fuel outdoors. When removable fuel containers are used, means shall be provided in the fuel system to minimize the escape of fuel when the containers are exchanged. You must use one of the following methods:

(i) Using an approved automatic quick-closing coupling (a type closing in both directions when uncoupled) in the fuel line; or

(ii) Closing the valve at the fuel container and allowing the engine to run until the fuel in the line is consumed.

[97-09-013, recodified as § 296-307-42509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42509, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42511 What requirements apply to piping, tubing, and fittings?** (1) Pipe from fuel container to first-stage regulator must be at least schedule 80 wrought iron or steel (black or galvanized), brass or copper; or seamless copper, brass, or steel tubing. Steel tubing must have a minimum wall thickness of 0.049 inch. Steel pipe or tubing must be adequately protected against exterior corrosion. Copper tubing must be types K or L or equivalent with a minimum wall thickness of 0.032 inch. Approved flexible connections may be used between container and regulator or between regulator and gas-air mixer. Using aluminum pipe or tubing is prohibited. For removable containers, an approved flexible connection must be used between the container and the fuel line.

(2) All piping must be installed, braced, and supported to minimize vibration strains or wear.

[97-09-013, recodified as § 296-307-42511, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42511, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42513 What requirements apply to safety devices?** (1) Spring-loaded internal safety-relief valves must be used on all motor fuel containers.

(2) The discharge outlet from safety-relief valves must be located on the outside of enclosed spaces and as far as practical from possible sources of ignition, and vented

upward within 45 degrees of the vertical to prevent impingement of escaping gas upon containers, or parts of vehicles, or on vehicles in adjacent lines of traffic. A rain cap or other protector must be used to keep water and dirt from collecting in the valve.

(3) When a discharge line from the container safety-relief valve is used, the line shall be metallic, other than aluminum, and must be sized, located, and maintained so as not to restrict the required flow of gas from the safety-relief valve. The discharge line must be able to withstand the pressure resulting from the discharge of vapor when the safety-relief valve is in the full open position. Flexible metal hose or tubing must be used when necessary.

(4) Portable containers equipped for volumetric filling may be filled in either the vertical or horizontal position only when oriented to place the safety-relief valve in communication with the vapor space.

[97-09-013, recodified as § 296-307-42513, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42513, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42515 What requirements apply to vaporizers?** (1) Vaporizers, their parts, and other devices that may be subjected to container pressure must have a design pressure of at least 250 psig.

(2) Each vaporizer must have a valve or suitable plug that will permit substantially complete draining of the vaporizer. It must be located at or near the lowest portion of the section occupied by the water or other heating medium.

(3) Vaporizers must be securely fastened to minimize the possibility of loosening.

(4) Each vaporizer must be permanently marked at a visible point as follows:

(a) With the design pressure of the fuel-containing portion in psig.

(b) With the water capacity of the fuel-containing portion of the vaporizer in pounds.

(5) Devices to supply heat directly to a fuel container must have an automatic device to cut off the supply of heat before the pressure inside the fuel container reaches 80% of the start-to-discharge pressure setting of the safety-relief device on the fuel container.

(6) Engine exhaust gases may be used as a direct source of heat supply for the vaporization of fuel if the materials of construction of those parts of the vaporizer in contact with exhaust gases are resistant to the corrosive action of exhaust gases and the vaporizer system is designed to prevent excessive pressures.

(7) Fusible plugs are prohibited on vaporizers.

[97-09-013, recodified as § 296-307-42515, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42515, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42517 What requirements apply to gas regulating and mixing equipment?** (1) Approved automatic pressure reducing equipment must be installed securely between the fuel supply container and gas-air mixer to reduce the pressure of the fuel delivered to the gas-air mixer.

(2) An approved automatic shut-off valve must be provided in the fuel system at some point ahead of the inlet of the gas-air mixer, designed to prevent flow of fuel to the mixer

when the ignition is off and the engine is not running. For industrial trucks and engines operating in buildings other than those used exclusively to house engines, the automatic shut-off valve must be designed to operate if the engine stops. Atmospheric regulators (zero governors) are adequate as an automatic shut-off valve only in cases of outdoor operation such as farm tractors, construction equipment, irrigation pump engines, and other outdoor stationary engine installations.

(3) The source of air for combustion must be completely isolated from the passenger compartment, ventilating system, or air-conditioning system.

[97-09-013, recodified as § 296-307-42517, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42517, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42519 What is the maximum container capacity allowed?** A single fuel container used on passenger carrying vehicles must have a maximum of 200 gallons water capacity. A single fuel container on other vehicles normally operating on the highway must have a maximum of 300 gallons water capacity except as provided in WAC 296-307-42503(1).

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-42519, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42519, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42519, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42521 What requirements apply to stationary engines used indoors?** Stationary engines and gas turbines installed in buildings, including portable engines used instead of or to supplement stationary engines, must comply with the Standard for the Institution and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37-1970, and the appropriate requirements of WAC 296-307-410 through 296-307-420.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-42521, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42521, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42521, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42523 What requirements apply to portable engines used indoors?** (1) Portable engines may be used in buildings only for emergency use, and according to WAC 296-307-42521.

(2) Exhaust gases must be discharged outside the building or to an area where they will not constitute a hazard.

(3) Provision must be made to supply sufficient air for combustion and cooling.

(4) An approved automatic shut-off valve must be provided in the fuel system ahead of the engine, designed to prevent flow of fuel to the engine when the ignition is off or if the engine should stop.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-42523, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-42523, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42523, filed 10/31/96, effective 12/1/96.]

(2007 Ed.)

**WAC 296-307-42525 What requirements apply to industrial trucks used indoors?** (1) LP-gas-fueled industrial trucks may be used in buildings and structures.

(2) No more than two LP-gas containers must be used on an industrial truck for motor fuel purposes.

(3) LP-gas-fueled industrial trucks may be used in buildings frequented by the public, when occupied by the public. The total water capacity of containers on each industrial truck must be a maximum of 105 pounds (nominal 45 pounds LP-gas).

(4) Trucks must be attended at all times in areas occupied by the public.

(5) Industrial trucks must not be parked and left unattended in areas of possible excessive heat or sources of ignition.

[97-09-013, recodified as § 296-307-42525, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42525, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-42527 How must LP-gas-fueled vehicles be garaged?** (1) LP-gas-fueled vehicles may be stored or serviced inside garages if there are no leaks in the fuel system and the fuel tanks are not filled beyond the maximum filling capacity allowed.

(2) LP-gas-fueled vehicles being repaired in garages must have the container shut-off valve closed except when fuel is required for engine operation.

(3) Such vehicles must not be parked near sources of heat, open flames, or similar sources of ignition or near open pits unless such pits are adequately ventilated.

[97-09-013, recodified as § 296-307-42527, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42527, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-430 Storage of containers awaiting use or resale.**

[97-09-013, recodified as § 296-307-430, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-430, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43001 What does this section cover?** WAC 296-307-430 applies to the storage of portable containers a maximum of 1,000 pounds water capacity, filled or partially filled, at user location but not connected for use, or in storage for resale by dealers or resellers. This section does not apply to containers stored at charging plants or at plants devoted primarily to the storage and distribution of LP-gas or other petroleum products.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-43001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-43001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43003 What general requirements apply to storage of containers?** (1) Containers in storage must be located to minimize exposure to excessive temperature rise, physical damage, or tampering.

(2) Containers stored inside must be located away from exits, stairways, or in areas normally used or intended for the safe exit of people.

[Title 296 WAC—p. 2519]

(3) Container valves must be protected while in storage as follows:

(a) By setting into recess of container to prevent the possibility of their being struck if the container is dropped upon a flat surface; or

(b) By ventilated cap or collar, fastened to container capable of withstanding blow from any direction equivalent to that of a thirty-pound weight dropped four feet. Construction must be such that a blow will not be transmitted to a valve or other connection.

(4) The outlet valves of containers in storage must be closed.

(5) Empty containers that have been in LP-gas service should preferably be stored in the open. When stored inside, they must be considered full containers for the purpose of determining the maximum quantity of LP-gas permitted by this section.

[97-09-013, recodified as § 296-307-43003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43005 How must containers be stored within buildings frequented by the public?** DOT containers with a maximum individual water capacity of 2-1/2 pounds, used with completely self-contained hand torches and similar applications, may be stored or displayed in a building frequented by the public. The display of such containers must be limited to a total of 24 units of each brand and size. The total quantity on display and in storage must not exceed 200 pounds LP-gas.

[97-09-013, recodified as § 296-307-43005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43007 How must containers be stored in buildings not frequented by the public?** (1) The quantity of LP-gas stored must be a maximum of 300 pounds (approximately 2,550 cubic feet in vapor form), except when stored within special buildings or rooms.

(2) Containers carried as a part of service equipment on highway mobile vehicles are not considered in the total storage capacity if the vehicles are stored in private garages, and are limited to one container per vehicle with a maximum LP-gas capacity of 100 pounds. All container valves must be closed.

[97-09-013, recodified as § 296-307-43007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43009 How must containers be stored within special buildings or rooms?** (1) The quantity of LP-gas stored in special buildings or rooms must be a maximum of 10,000 pounds.

(2) The walls, floors, and ceilings of container storage rooms that are within or adjacent to other parts of the building must be constructed of material having at least a two-hour fire resistance rating.

(3) At least 10% of the exterior walls or roof must be of explosion relieving construction.

[Title 296 WAC—p. 2520]

(4) Each opening from storage rooms to other parts of the building must be protected by a listed one and one-half hour "(B)" fire door.

(5) Such rooms must have no open flames for heating or lighting.

(6) Such rooms must be adequately ventilated both top and bottom to the outside only. The openings from such vents must be at least five feet away from any other opening into any building.

(7) The floors of such rooms must not be below ground level. Any space below the floor must be of solid fill or properly ventilated to the open air.

(8) Such storage rooms must not be located adjoining the line of property occupied by schools, churches, hospitals, athletic fields or other points of public gathering.

[97-09-013, recodified as § 296-307-43009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43011 How must containers be stored outdoors?** (1) Storage outside of buildings, for containers awaiting use or resale, must be located according to the table below with respect to:

- (a) The nearest important building or group of buildings;
- (b) The line of adjoining property that may be built on;
- (c) Busy thoroughfares;
- (d) The line of adjoining property occupied by schools, churches, hospitals, athletic fields, or other points of public gathering.

Quantity of LP-Gas Stored	Distance
500 pounds or less	0
501 to 2,500 pounds	0*
2,501 to 6,000 pounds	10 feet
6,001 to 10,000 pounds	20 feet
Over 10,000 pounds	25 feet

\*Containers must be at least ten feet from any building on adjoining property, any sidewalk, or any of the exposures described in (c) or (d) of this subsection.

(2) Containers must be in a suitable enclosure or otherwise protected against tampering.

[97-09-013, recodified as § 296-307-43011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43013 What fire protection must be provided for stored containers?** Storage locations other than supply depots separated and located apart from dealer, reseller, or user establishments must have at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

[97-09-013, recodified as § 296-307-43013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-435 LP-gas system installations on commercial vehicles.**

[97-09-013, recodified as § 296-307-435, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-435, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43501 What does this section cover?**

(1) WAC 296-307-435 applies to:

(a) LP-gas system installations on vehicles (self-propelled, trailers, or semitrailers) used for commercial or construction purposes;

(b) All exchangeable container systems with container capacities greater than 105 pounds water capacity (approximately 45 pounds LP-gas capacity); and

(c) Systems using containers permanently mounted on vehicles.

(2) All LP-gas installations on commercial vehicles must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section. When such a vehicle is permanently parked, and LP-gas is supplied from a system not mounted on and secured to the unit, WAC 296-307-415 and 296-307-420 also apply.

(3) This section does not apply to LP-gas motor fuel systems covered by WAC 296-307-425.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-43501, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-43501, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43501, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43503 How must containers be constructed?** Containers must be constructed according to WAC 296-307-41011, and marked according to the applicable requirements of WAC 296-307-41015, and must also meet the following:

(1) Containers designed for use as portable cylinders must be constructed according to DOT specifications.

(2) All other containers whether designed for permanent mounting, or for portable or semiportable use (such as skid tanks), must be constructed as provided for by WAC 296-307-41009(4) and 296-307-41011(1).

(3) Nonrecessed container fittings and accessories must be protected against damage by either:

(a) Their location;

(b) The vehicle frame or bumper; or

(c) Protective housing. The housing must meet the requirements under which the tanks are fabricated with respect to design and construction and must be designed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with the lading at a safety factor of at least four, based on the ultimate strength of the material used. The housing must have a weather cover if necessary to ensure proper operation of valves and safety devices.

(4) Manually operated shut-off valves or self-closing internal valves must be closed except during transfer operations.

(5) Permanently installed containers must meet the following requirements:

(a) Tank motor vehicles with frames not made integral with the tank, as by welding, must have turnbuckles or similar positive devices for drawing the tank down tight on the frame. In addition, suitable stops or anchors must be attached to the frame and/or the tank to prevent relative motion between them from starting, stopping, and turning. The stops and anchors must be installed to be accessible for inspection and maintenance.

(2007 Ed.)

(b) Any tank motor vehicle designed and constructed so that the cargo tank constitutes the stress member used instead of a frame must be supported by external cradles enclosing at least 120 degrees of the shell circumference. The design calculations must include beam stress, shear stress, torsion stress, bending moment, and acceleration stress for the cargo tank as a whole using a factor of safety of four, based on the ultimate tensile strength of the material. Maximum concentrated stresses that might be created at pads and cradles due to shear, bending, and torsion shall also be calculated according to Appendix G of the American Society of Mechanical Engineers, Unfired Pressure Vessel Code, 1968. Fully loaded vehicles must be assumed to be operating under highway conditions equal to two "g" loading. The effects of fatigue shall be taken into consideration. Cargo tanks mounted on frames may be supported by upright supports attached to pads if these factors are taken into account.

(c) Where any tank support is attached to any part of a tank head, the stresses imposed upon the head must be provided for as required above.

(d) Tank supports, stops, anchors, and bumpers must not be welded directly to the tank but must be attached by means of pads of the same material as the tank. The pad thickness must be at least 1/4 inch, or the thickness of the shell material if less, and no greater than the shell material. Each pad must extend at least four times its thickness, in each direction, beyond the weld attaching the support, bumper, stop, or anchor. Each pad must be preformed to an inside radius no greater than the outside radius of the tank at the place of attachment. Each pad corner must be rounded to a radius at least one-fourth the width of the pad, and no greater than one-half the width of the pad. Weepholes and tell-tale holes, if used, must be drilled or punched before the pads are attached to the tank. Each pad must be attached to the tank by continuous fillet welding using filler material having properties that meet the recommendations of the maker of the shell and head material.

(6) Portable or semiportable containers must meet the applicable requirements of WAC 296-307-42507(3). Containers designed for permanent installation as part of systems under WAC 296-307-420 are prohibited.

(a) Filling connections must have an approved automatic back pressure check valve, excess flow check valve, or quick closing internal valve to prevent excessive escape of gas in case the filling connection is broken.

Exception: Where the filling and discharge connect on a common opening in the container shell, and the opening is fitted with a quick-closing internal valve, the automatic valve is not required.

Every inlet and outlet connection must have a manually or automatically operated shut-off valve. Liquid discharge openings, except those for engine fuel lines, on tanks built after September 1, 1965, must be fitted with a remotely controlled internal shut-off valve. Valves must meet the following requirements:

(i) The seat of the valve must be inside the tank, or in the opening nozzle or flange, or in a companion flange bolted to the nozzle or flange.

(ii) All parts of the valve inside the tank, nozzle, or companion flange must be made of material that protects against corrosion or other deterioration in the presence of the lading.

(iii) The parts must be arranged so that damage to parts exterior to the tank will not prevent effective seating of the valve.

(iv) The valve may be operated mechanically, by hydraulically, or by air, or gas pressure.

(v) The valve must have remote means of automatic closure, both mechanical and thermal, in at least two places for tanks over 3,500 gallons water capacity. These remote control stations must be located at each end of the tank and diagonally opposite. The thermal control mechanism must have a fusible element with a melting point between 220°F and 208°F. At least one remote control station must be provided for tanks of 3,500 gallons water capacity or less, and such actuating means may be mechanical.

(b) All other connections to containers, except those used for gauging devices, thermometer wells, safety-relief devices, and plugged openings, must have suitable automatic excess flow valves, or may instead be fitted with quick-closing internal valves.

The control mechanism for the internal valve must have a secondary control, remote from the fill or discharge connections (for use in the event of accidents or fire during delivery operations), and such control mechanism must have a fusible element with a melting point not over 220°F or less than 208°F.

(c) Excess flow valves must close automatically at the rated flow of vapor or liquid as specified by the valve manufacturers. The flow rating of the piping beyond the excess flow valve must be greater than that of the excess flow valve and such rating must include valves, fittings, and hose.

Exception: When branching or necessary restrictions are incorporated in a piping system so that flow ratings are less than that of the excess flow valve and the tank, then additional excess flow valves must be installed in the piping where such flow rate is reduced.

(d) Container inlets and outlets, except those used for safety-relief valves, liquid-level gauging devices, and pressure gauges, must be labeled to designate whether they communicate with vapor or liquid space when the container is filled to maximum permitted filling density. Labels may be on the valves.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-43503, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-43503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43505 What is the maximum capacity allowed for LP-gas installations on commercial vehicles?** A single fuel container used on passenger carrying vehicles must not exceed 200 gallons water capacity.

[97-09-013, recodified as § 296-307-43505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43505, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43507 Where must systems be located?** (1) Containers must not be installed, transported, or stored (even temporarily) inside any vehicle covered by these standards except as provided by the DOT regulations.

(2) Containers, control valves, and regulating equipment comprising a complete system must be suitably protected

against damage and weather. Systems may be installed in a recess vaportight to the inside of the vehicle and accessible from and vented to the outside.

(3) Systems installed outside of mobile units must be located so that discharge from safety-relief devices must be at least 3 feet horizontally away from any opening into the unit below the level of such discharge. When the system is located in a recess vaportight to the inside, vent openings in the recess must be at least 3 feet horizontally away from any opening into the mobile unit below the level of these vents.

(4) There must be no fuel connection between tractor and trailer or other vehicle units.

(5) The container or container carrier must be secured in place by fastenings designed and constructed with a minimum safety factor of four to withstand loading in any direction equal to twice the weight of the container when filled to normal capacity with LP-gas.

[97-09-013, recodified as § 296-307-43507, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43507, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43509 What requirements apply to valves and accessories?** Container valves and accessories must be provided, protected and mounted as follows:

(1) Systems using DOT cylinders according to WAC 296-307-41511.

(2) All other systems according to WAC 296-307-42005 (2) through (8).

(3) Portable, semiportable and permanently mounted containers shall be mounted and protected as provided under WAC 296-307-43503 (2), (5), and (6).

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-43509, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-43509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43509, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43511 What requirements apply to safety devices?** (1) DOT containers must have safety-relief devices as required by DOT regulations.

(2) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

(3) The relief valve and space above the regulator and relief valve diaphragms must be vented to the outside air and terminate at a position to minimize the possibility of vapors accumulating at sources of ignition.

(4) Whenever equipment such as a cargo heater or cooler on commercial vehicles is designed to be in operation while in transit, suitable means to stop the flow such as an excess flow valve or other device, must be installed. This device will be actuated to stop the flow in the event of the break in the fuel supply line. All excess flow valves must comply with WAC 296-307-41019(3).

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-43511, filed 12/1/98, effective 3/1/99. 97-09-013 recodified as § 296-307-43511, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43511, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43513 What types of systems may be used on commercial vehicles?** Commercial vehicles must use either vapor withdrawal or liquid withdrawal systems.

[97-09-013, recodified as § 296-307-43513, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43513, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43515 What requirements apply to enclosures and mounting?** (1) Housing or enclosures must be designed to provide proper ventilation.

(2) Hoods, domes, or removable portions of cabinets must have means to keep them firmly in place during transit.

(3) The assembly must hold the containers firmly in position and prevent their movement during transit according to WAC 296-307-42507(3).

(4) Containers must be mounted on a substantial support or base secured firmly to the vehicle chassis. Neither the container nor its support must extend below the frame.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-43515, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-43515, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43515, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43517 What requirements apply to piping, tubing, and fittings?** (1) Regulators must be connected directly to the container valve outlet or mounted securely by means of support bracket and connected to the container valve or valves with a listed high pressure flexible connector.

(2) Provision must be made between the regulator outlet and the gas service lines by either a flexible connector or a tubing loop to provide for expansion, contraction, jarring, and vibration.

(3) Aluminum alloy piping is prohibited. Steel tubing must have a minimum wall thickness of 0.049 inch. Steel piping or tubing must be adequately protected against exterior corrosion.

(4) Approved gas tubing fittings must be used for tubing connections.

(5) The fuel line must be firmly fastened in a protected location and where under the vehicle and outside and below any insulation or false bottom, fastenings must prevent abrasion or damage to the gas line due to vibration. Where the fuel line passes through structural members or floors, a rubber grommet or equivalent must be installed to prevent chafing.

(6) The fuel line must be installed to enter the vehicle through the floor directly beneath or adjacent to the appliance that it serves. When a branch line is required, the tee connection must be in the main fuel line and located under the floor and outside the vehicle.

(7) All parts of the system assembly must be designed and secured to preclude such parts working loose during transit.

[97-09-013, recodified as § 296-307-43517, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43517, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43519 What requirements apply to appliances?** (1) LP-gas appliances must be approved for use on commercial vehicles.

(2007 Ed.)

(2) In vehicles not intended for human occupancy, where the gas-fired heating appliance is used to protect the cargo, such heater may be unvented, but provision must be made to dispose of the products of combustion to the outside.

(3) In vehicles intended for human occupancy, all gas-fired heating appliances, including water heaters, must be designed or installed to provide for complete separation of the combustion system from the atmosphere of the living space. Such appliances must be installed with the combustion air inlet assembly furnished as a component of the appliance, and with either:

(a) The flue gas outlet assembly furnished as a component of the appliance; or

(b) A listed roof jack if the appliance is listed for such use.

The combustion air inlet assembly, flue gas outlet assembly, and roof jack must extend to the outside atmosphere.

(4) Provision must be made to ensure an adequate supply of outside air for combustion.

(5) All gas-fired heating appliances and water heaters must have an approved automatic device designed to shut off the flow of gas to the main burner and to the pilot in the event the pilot flame is extinguished.

(6) Gas-fired appliances installed in the cargo space must be readily accessible.

(7) Appliances must be constructed or protected to minimize the possible damage or impaired operation resulting from cargo shifting or handling.

(8) Appliances inside the vehicle must be located so that a fire at an appliance will not block the exit route.

[97-09-013, recodified as § 296-307-43519, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43519, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43521 What general precautions must be followed for LP-gas system installations on commercial vehicles?** (1) DOT containers must be marked, maintained, and requalified for use according to DOT regulations.

(2) Containers that have not been requalified according to DOT regulations must be removed from service. Requalified containers must be stamped with the date of requalification. When DOT cylinders are requalified by retesting, the retest must be made according to DOT regulations.

(3) Containers must not be charged with fuel unless they bear the proper markings of the code under which they were constructed, and with their water capacity. In the case of cylinders or portable containers filled by weight, the container must be marked with its tareweight.

(4) DOT containers that have been involved in a fire must not be recharged until they have been requalified for service according to DOT regulations.

(5) API-ASME containers or ASME containers that have been involved in a fire must not be recharged until they have been retested according to the requirements for their original hydrostatic test and found to be suitable for continued service.

"API-ASME (ASME) container" means a container constructed according to the Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society

of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1968 edition.

(6) Containers must not be charged without the consent of the owner.

(7) A permanent caution plate must be provided on the appliance or adjacent to the container outside of any enclosure. It must include the word "caution" and the following or similar instructions.

(a) Be sure all appliance valves are closed before opening container valve.

(b) Connections at appliances, regulators, and containers must be checked periodically for leaks with soapy water or its equivalent.

(c) A match or flame must not be used to check for leaks.

(d) Container valves must be closed except when the equipment is in use.

[97-09-013, recodified as § 296-307-43521, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43521, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43523 How must containers be charged?** Containers must be charged according to DOT specifications.

[97-09-013, recodified as § 296-307-43523, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43523, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-43525 What fire protection must be provided for mobile cook units?** Mobile cook units must have at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

[97-09-013, recodified as § 296-307-43525, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43525, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-440 LP-gas service stations.**

[97-09-013, recodified as § 296-307-440, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-440, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44001 What does this section cover?** WAC 296-307-440 applies to storage containers, dispensing devices, and pertinent equipment in service stations where LP-gas is stored and dispensed into fuel tanks of motor vehicles. LP-gas service stations must meet all requirements of WAC 296-307-410 and the requirements of this section.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-44001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-44001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44003 How must storage containers be designed and classified?** Storage containers must be designed and classified according to the following table:

[Title 296 WAC—p. 2524]

Container type	For gases with vapor press. Not to exceed lb. per sp. in. gauge 100°F (37.8°C.)	Minimum design pressure of container lb. per sp. in. gauge	
		1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code <sup>2</sup>
200 <sup>1</sup>	215	200	250

<sup>1</sup>Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designation when constructed under 1949 or earlier editions of ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under: 1. The 1949 ASME Code (Par. U-200 and U-201), 2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and 3. All editions of the API-ASME Code.

<sup>2</sup>Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

[97-09-013, recodified as § 296-307-44003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44005 What requirements apply to valves and accessories?** (1) A filling connection on the container must be fitted with one of the following:

(a) A combination back-pressure check and excess flow valve.

(b) One double or two single back-pressure valves.

(c) A positive shut-off valve, in conjunction with either:

(i) An internal back-pressure valve; or

(ii) An internal excess flow valve.

Instead of an excess flow valve, filling connections may be fitted with a quick-closing internal valve that only opens during operating periods. The mechanism for such valves may have a secondary control that will close automatically in case of fire. The melting point for a fusible plug must be a maximum of 220°F.

(2) A filling pipe inlet terminal off the container must have a positive shut-off valve and either:

(a) A back pressure check valve; or

(b) An excess flow check valve.

(3) All openings in the container must have approved excess flow check valves.

Exceptions: (a) Filling connections;  
(b) Safety-relief connections;  
(c) Liquid-level gauging devices; and  
(d) Pressure gauge connections.

(4) All container inlets and outlets must be labeled to designate whether they connect with vapor or liquid (labels may be on valves).

Exceptions: (a) Safety-relief valves;  
(b) Liquid-level gauging devices; and  
(c) Pressure gauges.

(5) Each storage container must have a suitable pressure gauge.

[97-09-013, recodified as § 296-307-44005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44007 What requirements apply to safety devices?** (1) All safety-relief devices must be installed as follows:

(a) On the container and directly connected with the vapor space.

(b) Safety-relief valves and discharge piping shall be protected against physical damage. The outlet must have loose-fitting rain caps. There shall be no return bends or restrictions in the discharge piping.

(c) The discharge from two or more safety-relief valves with the same pressure settings may be run into a common discharge header. The cross-sectional area of such header must be at least equal to the sum of the individual discharges.

(d) Discharge from a safety-relief device that terminates in or beneath any building is prohibited.

(2) Aboveground containers must have safety-relief valves as follows:

(a) The rate of discharge, which may be provided by one or more valves, must be at least that specified in WAC 296-307-41025(2).

(b) The discharge from safety-relief valves must be vented upward to the open air to prevent impingement of escaping gas upon the container. You must use loose-fitting rain caps. On a container having a water capacity greater than 2,000 gallons, the discharge from the safety-relief valves must be vented upward away from the container to a point at least 7 feet above the container. Provisions must be made so that any liquid or condensate accumulation inside the relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, you must protect the container, adjacent containers, piping, or equipment against impingement of flame resulting from ignition of the product escaping from the drain.

(3) Underground containers must have safety-relief valves as follows:

(a) The discharge from safety-relief valves must be piped upward to a point at least 10 feet above the ground. The discharge lines or pipes must be adequately supported and protected against physical damage.

(b) In areas where the manhole or housing may flood, the discharge from regulator vent lines should be above the highest probable water level.

(c) If no liquid is put into a container until after it is buried and covered, the rate of discharge of the relief valves may be reduced to at least 30 percent of the rate shown in WAC 296-307-41025(2). If liquid fuel is present during installation of containers, the rate of discharge must be the same as for aboveground containers. Only empty containers may be uncovered.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-44007, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-44007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44009 What is the maximum capacity allowed for containers?** Individual storage containers must be a maximum of 30,000 gallons water capacity.

[97-09-013, recodified as § 296-307-44009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44011 How must storage containers be installed?** (1) Each storage container used exclusively in service station operation must comply with the following table. This table outlines the minimum distances from a container to a building, group of buildings, or adjoining property lines that may be built on.

Water capacity per container (gallons)	Minimum distances	
	Aboveground and underground (feet)	Between aboveground containers (feet)
Up to 2,000	25	3
Over 2,000	50	5

*Note:* The above distances may be reduced to at least 10 feet for service station buildings of other than wood frame construction.

(a) Readily ignitable material including weeds and long dry grass, must be removed within 10 feet of containers.

(b) The minimum separation between LP-gas containers and flammable liquid tanks must be 20 feet and the minimum separation between a container and the centerline of the dike must be 10 feet.

(c) LP-gas containers located near flammable liquid containers must be protected against the flow or accumulation of flammable liquids by diking, diversion curbs, or grading.

(d) LP-gas containers located within diked areas for flammable liquid containers are prohibited.

(e) Field welding is permitted only on saddle plates or brackets that were applied by the container manufacturer.

(f) When permanently installed containers are interconnected, you must allow for expansion, contraction, vibration, and settling of containers and interconnecting piping. Where flexible connections are used, they must be approved and designed for a bursting pressure of at least five times the vapor pressure of the product at 100°F. Using nonmetallic hose is prohibited for interconnecting containers.

(g) Where high water table or flood conditions may be encountered, you must protect against container flotation.

(2) Aboveground containers must be installed according to this section.

(a) Containers may be installed horizontally or vertically.

(b) Containers must be protected by crash rails or guards to prevent physical damage unless they are protected by location. Servicing vehicles within 10 feet of containers is prohibited.

(c) Container foundations must be of substantial masonry or other noncombustible material. Containers must be mounted on saddles that permit expansion and contraction, and must provide against excess stresses. Corrosion protection must be provided for tank-mounting areas. Structural metal container supports must be protected against fire.

*Exception:* This protection is not required on prefabricated storage and pump assemblies, mounted on a common base, with container bottom a maximum of 24 inches above ground with water capacity of 2,000 gallons or less, if the piping connected to the storage and pump assembly is flexible enough to minimize breakage or leakage in case container supports fail.

(3) Underground containers must be installed according to this section.

(a) Containers must be given a protective coating before being placed underground. This coating must be equivalent to hot-dip galvanizing or to two coatings of red lead followed by

a heavy coating of coal tar or asphalt. During installation, take care to minimize abrasion or other damage to the coating. Repair coating damage before back-filling.

(b) Containers must be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(c) A minimum of 2 feet of earth cover must be provided. Where ground conditions make impractical, equivalent protection against physical damage must be provided. The portion of the container to which manhole and other connections are attached may be left uncovered. If there is vehicle traffic at the site, containers must be protected by a concrete slab or other cover to prevent the weight of a loaded vehicle imposing a load on the container shell.

[97-09-013, recodified as § 296-307-44011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44013 What equipment must be protected against tampering?** Valves, regulators, gauges, and other container fittings must be protected against tampering and physical damage.

[97-09-013, recodified as § 296-307-44013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44015 What requirements apply to the transport truck unloading point?** (1) During unloading, the transport truck must not be parked on public thoroughfares and must be at least 5 feet from storage containers. The truck must be positioned so that shut-off valves are accessible.

(2) The filling pipe inlet terminal must not be located within a building nor within 10 feet of any building or driveway. It must be protected against physical damage.

[97-09-013, recodified as § 296-307-44015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44017 What requirements apply to piping, valves, and fittings?** (1) Piping may be underground, aboveground, or a combination of both. It must be well supported and protected against physical damage and corrosion.

(2) Piping laid beneath driveways must be installed to prevent physical damage by vehicles.

(3) Piping must be wrought iron or steel (black or galvanized), brass or copper pipe; or seamless copper, brass, or steel tubing and must be suitable for a minimum pressure of 250 psig. Pipe joints may be screwed, flanged, brazed, or welded. The use of aluminum alloy piping or tubing is prohibited.

(4) All shut-off valves (liquid or gas) must be suitable for LP-gas service and designed for at least the maximum pressure to which they may be subjected. Valves that may be subjected to container pressure must have a rated working pressure of at least 250 psig.

(5) All materials used for valve seats, packing, gaskets, diaphragms, etc., must be resistant to the action of LP-gas.

(6) Fittings must be steel, malleable iron, or brass having a minimum working pressure of 250 psig. Cast iron pipe fittings, such as ells, tees and unions must not be used.

(7) All piping must be tested after assembly and proved free from leaks at least at the normal operating pressures.

(8) You must allow for expansion, contraction, jarring, and vibration, and for settling. You may use flexible connections.

[97-09-013, recodified as § 296-307-44017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44019 What requirements apply to pumps and accessory equipment?** All pumps and accessory equipment must be suitable for LP-gas service, and designed for at least the maximum pressure to which they may be subjected. Accessories must have a minimum rated working pressure of 250 psig. Positive displacement pumps must have suitable pressure actuated bypass valves permitting flow from pump discharge to storage container or pump suction.

[97-09-013, recodified as § 296-307-44019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44019, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44021 What requirements apply to LP-gas dispensing devices?** (1) Meters, vapor separators, valves, and fittings in the dispenser must be suitable for LP-gas service and must be designed for a minimum working pressure of 250 psig.

(2) Provisions must be made for venting LP-gas from a dispensing device to a safe location.

(3) Pumps used to transfer LP-gas must allow control of the flow and to prevent leakage or accidental discharge. Means must be provided outside the dispensing device to readily shut off the power in the event of fire or accident.

(4) A manual shut-off valve and an excess flow check valve must be installed downstream of the pump and ahead of the dispenser inlet.

(a) Dispensing hose must be resistant to the action of LP-gas in the liquid phase and designed for a minimum bursting pressure of 1,250 psig.

(b) An excess flow check valve or automatic shut-off valve must be installed at the terminus of the liquid line at the point of attachment of the dispensing hose.

(5) LP-gas dispensing devices must be located at least 10 feet from aboveground storage containers greater than 2,000 gallons water capacity. The dispensing devices must be at least 20 feet from any building (not including canopies), basement, cellar, pit, or line of adjoining property that may be built on and at least 10 feet from sidewalks, streets, or thoroughfares. No drains or blowoff lines must be directed into or in proximity to the sewer systems used for other purposes.

(a) LP-gas dispensing devices must be installed on a concrete foundation or as part of a complete storage and dispensing assembly mounted on a common base, and must be adequately protected from physical damage.

(b) LP-gas dispensing devices must not be installed within a building.

Exception: Dispensing devices may be located under a weather shelter or canopy if the area is not enclosed on more than two sides. If the enclosing sides are adjacent, the area shall be properly ventilated.

(6) Dispensing LP-gas into the fuel container of a vehicle shall be performed by a competent attendant who shall remain at the LP-gas dispenser during the entire transfer operation.

[97-09-013, recodified as § 296-307-44021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44023 Is smoking allowed at LP-gas service stations?** Smoking is prohibited on the driveway of service stations in the dispensing areas or transport truck unloading areas. Conspicuous signs prohibiting smoking must be posted within sight of the customer being served. Letters on such signs must be at least 4 inches high. The motors of all vehicles being fueled must be shut off during the fueling operations.

[97-09-013, recodified as § 296-307-44023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44023, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-44025 What fire protection must be provided at LP-gas service stations?** Each service station must have at least one approved portable fire extinguisher with at least an 8-B, C, rating.

[97-09-013, recodified as § 296-307-44025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44025, filed 10/31/96, effective 12/1/96.]

### Part U-3 Other Hazardous Materials

#### Dipping and Coating Operations (Dip Tanks)

##### WAC 296-307-445 Scope.

###### IMPORTANT:

A **dip tank** is a container holding a liquid other than plain water that is used for dipping or coating. An object may be completely or partially immersed (in a dip tank) or it may be suspended in a vapor coming from the tank.

**Exemption:** Dip tanks that use a molten material (molten metal, alloy, salt, etc.) are not covered by this chapter.

This chapter **applies** to:

- A dip tank that uses a liquid other than plain water, or the vapor of the liquid, to:

- Clean an object
- Coat an object
- Alter the surface of an object

###### OR

- Change the character of an object.

- Draining or drying an object that has been dipped or coated.

Examples of covered dipping and coating operations include, but are not limited to:

- Paint dipping
- Anodizing
- Pickling
- Quenching
- Tanning
- Degreasing
- Stripping
- Cleaning

– Dyeing.

**Reference:** You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See personal protective equipment (PPE), WAC 296-307-100 through 296-307-10025.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-10-068, § 296-307-445, filed 5/6/03, effective 8/1/03.]

#### WAC 296-307-450 General requirements.

##### Summary.

##### Your responsibility:

Safeguard employees working with dip tanks.

##### You must:

###### CONSTRUCTION

Construct safe dip tanks

WAC 296-307-45005

###### VENTILATION

Provide proper ventilation for the vapor area

WAC 296-307-45010

Take additional precautions if you recirculate ventilation system exhaust air into the workplace

WAC 296-307-45015

Take additional precautions when using an exhaust hood

WAC 296-307-45020

###### INSPECTION

Periodically inspect your dip tanks and associated equipment and correct any deficiencies

WAC 296-307-45025

###### FIRST AID

Make sure employees working near dip tanks know appropriate first-aid procedures

WAC 296-307-45030

###### CLEANING

Prepare dip tanks before cleaning

WAC 296-307-45035

###### WELDING

Protect employees during welding, burning or other work using open flames

WAC 296-307-45045

###### LIQUIDS HARMFUL TO SKIN

Provide additional protection for employees working near dip tanks that use liquid that may burn, irritate, or otherwise harm the skin

WAC 296-307-45050.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-10-068, § 296-307-450, filed 5/6/03, effective 8/1/03; 97-09-013, recodified as § 296-307-450, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-450, filed 10/31/96, effective 12/1/96.]

#### Construction

##### WAC 296-307-45005 Construct safe dip tanks.

##### You must:

- Make sure dip tanks, including any drain boards, are strong enough to support the expected load.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-10-068, § 296-307-45005, filed 5/6/03, effective 8/1/03; 97-09-013, recodified as § 296-307-45005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45005, filed 10/31/96, effective 12/1/96.]

## Ventilation

### WAC 296-307-45010 Provide proper ventilation for the vapor area.

#### You must:

- Make sure mechanical ventilation meets the requirements of one or more of the following standards:
  - NFPA 34-1995, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids
  - ACGIH's "Industrial Ventilation: A Manual of Recommended Practice" (22nd ed., 1995)
  - ANSI Z9.1-1971, Practices for Ventilation and Operation of Open-Surface Tanks and ANSI Z9.2-1979, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

**Note:** Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

#### You must:

- Limit the vapor area to the smallest practical space by using mechanical ventilation
- Keep airborne concentration of any substance below twenty-five percent of its lower flammable limit (LFL)
  - Make sure mechanical ventilation draws the flow of air into a hood or exhaust duct
  - Have a separate exhaust system for each dip tank if the combination of substances being removed could cause a:
    - Fire
    - Explosion

#### OR

- Potentially hazardous chemical reaction.

**Reference:** You need to keep employee exposure within safe levels when the liquid in a dip tank creates an exposure hazard. See Respiratory hazards, chapter 296-307 WAC, Part Y-6.

**Note:** You may use a tank cover or material that floats on the surface of the liquid to replace or assist ventilation. The method or combination of methods you choose has to maintain the airborne concentration of the hazardous material and the employee's exposure within safe limits.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-45010, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-45010, filed 5/6/03, effective 8/1/03.]

### WAC 296-307-45015 Take additional precautions if you recirculate ventilation system exhaust air into the workplace.

#### You must:

- Only recirculate air that contains no substance at a concentration that could pose a health or safety hazard to employees
  - Make sure any exhaust system that recirculates air into the workplace:
    - Passes the air through a device that removes contaminants
    - Sounds an alarm and automatically shuts down the dip tank operation, if the vapor concentration of any substance in the exhaust air exceeds twenty-five percent of its LFL
    - Monitors the concentration of vapor from flammable or combustible liquids with approved equipment.

**Note:** • The LFL concentration in the air must be determined after the air passes through the air-cleaning device and before the air reenters the workspace

[Title 296 WAC—p. 2528]

- Most substances will pose a health hazard at a concentration far below twenty-five percent of its LFL.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45015, filed 5/6/03, effective 8/1/03; 97-09-013, recodified as § 296-307-45015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45015, filed 10/31/96, effective 12/1/96.]

### WAC 296-307-45020 Take additional precautions when using an exhaust hood.

#### You must:

- Make sure each room with an exhaust hood has a source of outside air that:
  - Enters the room in a way that will not interfere with the function of the hood
  - Replaces at least ninety percent of the air taken in through the hood.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45020, filed 5/6/03, effective 8/1/03.]

## Inspection

### WAC 296-307-45025 Periodically inspect your dip tanks and associated equipment and correct any deficiencies.

#### You must:

- Inspect or test your dip tanks and associated equipment periodically, including:
  - Covers
  - Overflow pipes
  - Bottom drains and valves
  - Electrical wiring, equipment, and grounding connections
  - Ventilating systems
  - Fire extinguishing equipment.
- Inspect the hoods and ductwork of the ventilation system for corrosion and damage and make sure the airflow is adequate:
  - At least quarterly during operation
  - Prior to operation after a prolonged shutdown.
- Promptly fix any deficiencies found.

**Note:** • To assist you in tracking your inspections and actions taken from those inspections, you may want to keep a written record

• It is recommended that inspections be at least quarterly even if the system is not operating. Depending on the chemicals in use more frequent inspection may be required.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45025, filed 5/6/03, effective 8/1/03; 97-09-013, recodified as § 296-307-45025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45025, filed 10/31/96, effective 12/1/96.]

## First Aid

### WAC 296-307-45030 Make sure employees working near dip tanks know appropriate first-aid procedures.

#### You must:

- Make sure your employees know the appropriate first-aid procedures for the hazards of your dipping and coating operations.

**Note:** • First-aid procedures are contained in the material safety data sheet (MSDS) for the chemicals used in the dip tank

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- First-aid supplies appropriate for the hazards of the dipping or coating operation need to be located near the dip tank to be considered "readily available" as required by WAC 296-307-03920.

**Reference:** There are additional requirements that may include providing emergency washing facilities and employee training. See first aid, WAC 296-307-039, and employer chemical hazard communication, WAC 296-307-550.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-45030, filed 5/6/03, effective 8/1/03.]

### Cleaning

#### **WAC 296-307-45035 Prepare dip tanks before cleaning. You must:**

- (1) Drain the contents of the tank and open any cleanout doors.
- (2) Ventilate the tank to clear any accumulated hazardous vapors.

**Reference:** There may be requirements that apply before an employee enters a dip tank. See Confined spaces, WAC 296-307-642 and safety procedures, WAC 296-307-320.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-45035, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-45035, filed 5/6/03, effective 8/1/03.]

### Welding

#### **WAC 296-307-45045 Protect employees during welding, burning, or other work using open flames.**

##### **You must:**

- Make sure the dip tank and the area around it are thoroughly cleaned of solvents and vapors before performing work involving:
    - Welding
    - Burning
- OR**
- Open flames.

**Reference:** There are additional requirements for this type of work. See Welding, cutting and brazing, WAC 296-307-475, and Respirators, chapter 296-307 WAC, Part Y-5.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-45045, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-45045, filed 5/6/03, effective 8/1/03.]

### Liquids Harmful to Skin

#### **WAC 296-307-45050 Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.**

##### **You must:**

- (1) Make sure washing facilities, including hot water, are available for every ten employees that work with dip tank liquids.
- (2) Satisfy medical requirements:
  - Make sure an employee with any small skin abrasion, cut, rash, or open sore receives treatment by a properly designated person
  - Make sure an employee with a sore, burn, or other skin lesion that needs medical treatment, has a physician's approval before they perform their regular work
  - Make sure employees who work with chromic acid receive periodic examinations of their exposed body parts, especially their nostrils.

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- Note:**
- Periodic means on a yearly basis unless otherwise indicated
  - Any time chromic acid spills onto an employee's skin or their clothing is saturated, a physician should be responsible for evaluating and monitoring the area where chromic acid made contact with the skin.

##### **You must:**

- (3) Provide lockers or other storage space to prevent contamination of street clothes.

**Reference:** You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See Personal protective equipment (PPE), WAC 296-307-100.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-10-068, § 296-307-45050, filed 5/6/03, effective 8/1/03.]

#### **WAC 296-307-455 Additional requirements for dip tanks using flammable or combustible liquids.**

##### **Summary.**

##### **IMPORTANT:**

This section applies to:

- Flammable and combustible liquids (flashpoint below 200°F)
- Liquids that have a flashpoint of 200°F (93.3°C) or higher if you:
  - Heat the liquid
  - Dip a heated object in the tank

##### **Your responsibility:**

Safeguard employees working with dip tanks containing flammable or combustible liquids

##### **You must:**

##### **CONSTRUCTION**

Include additional safeguards when constructing dip tanks

*WAC 296-307-45505*

Provide overflow pipes

*WAC 296-307-45510*

Provide bottom drains

*WAC 296-307-45515*

##### **FIRE PROTECTION**

Provide fire protection in the vapor area

*WAC 296-307-45520*

Provide additional fire protection for large dip tanks

*WAC 296-307-45525*

##### **ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION**

Prevent static electricity sparks or arcs when adding liquids to a dip tank

*WAC 296-307-45535*

Control ignition sources

*WAC 296-307-45540*

Provide safe wiring and electrical equipment where the liquid can drip or splash

*WAC 296-307-45545*

##### **HOUSEKEEPING**

Keep the area around dip tanks clear of combustible material and properly dispose of waste

*WAC 296-307-45550*

##### **HEATING LIQUID**

Make sure heating the liquid in your dip tanks does not cause a fire

*WAC 296-307-45555*

**HEAT DRYING**

Make sure a heating system used for drying objects does not cause a fire

WAC 296-307-45560

**CONVEYORS**

Make sure the conveyor system for dip tanks is safe

WAC 296-307-45565

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-455, filed 5/6/03, effective 8/1/03.]

**Construction**

**WAC 296-307-45505 Include additional safeguards when constructing dip tanks.**

**You must:**

- (1) Make sure the dip tank, drain boards (if provided), and supports are made of noncombustible material.
- (2) Make sure piping connections on drains and overflow pipes allow easy access to the inside of the pipe for inspection and cleaning.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45505, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-45510 Provide overflow pipes.**

**You must:**

- Provide an overflow pipe on dip tanks that:
  - Hold more than one hundred fifty gallons of liquid
- OR**
- Have more than ten square feet of liquid surface area.
- Make sure the overflow pipe is:
  - Properly trapped
  - Able to prevent the dip tank from overflowing
  - Three inches or more (7.6 cm) in diameter
  - Discharged to a safe location.

**Note:** Discharged to a safe location could be a:  
 • Safe location outside the building  
**OR**  
 • Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

**You must:**

- Make sure the bottom of the overflow pipe is at least six inches (15.2 cm) below the top of the tank.

**Note:** The overflow pipe should be large enough to remove water applied to the liquid surface of the dip tank from automatic sprinklers or other sources in the event of fire. Smaller dip tanks should be equipped with overflow pipes, if practical.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45510, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-45515 Provide bottom drains.**

**Exemption:** A bottom drain is not required if:  
 – The viscosity of the liquid makes it impractical to empty the tank by gravity or pumping  
**OR**  
 – The dip tank has an automatic closing cover that meets the requirements of WAC 296-307-45530.

**You must:**

- Provide a bottom drain on all dip tanks that hold more than five hundred gallons of liquid
- Make sure the bottom drain:
  - Is properly trapped
  - Will empty the dip tank during a fire
  - Has pipes large enough to empty the tank within five minutes

- Uses automatic pumps if gravity draining is not practical
- Is capable of both manual and automatic operation
- Discharges to a safe location.

**Note:** Discharges to a safe location could be a:  
 • Safe location outside the building  
**OR**  
 • Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

**You must:**

- Make sure manual operation of the bottom drain is performed from a safe and easily accessible location.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45515, filed 5/6/03, effective 8/1/03.]

**Fire Protection**

**WAC 296-307-45520 Provide fire protection in the vapor area.**

**You must:**

- Provide a manual fire extinguisher near the tank that is suitable for putting out flammable and combustible liquid fires.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45520, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-45525 Provide additional fire protection for large dip tanks.**

**You must:**

- Provide at least one automatic fire extinguishing system or an automatic dip tank cover if the tank:
  - Holds one hundred fifty gallons or more of liquid
- OR**
- Has four square feet or more of liquid surface area.
- Make sure automatic fire extinguishing systems or automatic dip tank covers meet the requirements of Table 1.

**Exemption:** An automatic fire extinguishing system or an automatic dip tank cover is **not** required for a hardening or tempering tank that:  
 • Holds less than five hundred gallons  
**OR**  
 • Has less than twenty-five square feet of liquid surface area.

**Table 1: Automatic Fire Protection System Requirements**

<b>If you provide:</b>	<b>Then you must:</b>
An automatic fire extinguishing system	<ul style="list-style-type: none"> <li>• Use extinguishing materials suitable for a fire fueled by the liquid in the tank</li> <li>• Make sure the system protects the:                             <ul style="list-style-type: none"> <li>– Tanks</li> <li>– Drain boards</li> <li>– Stock over drain boards.</li> </ul> </li> </ul>
A dip tank cover	<ul style="list-style-type: none"> <li>• Make sure the cover is:                             <ul style="list-style-type: none"> <li>– Closed by approved automatic devices in the event of fire</li> <li>– Able to be manually activated</li> <li>– Kept closed when the tank is not being used</li> <li>– Made of noncombustible material or metal-clad material with locked metal joints.</li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45525, filed 5/6/03, effective 8/1/03.]

### Electrical Wiring and Equipment and Sources of Ignition

#### **WAC 296-307-45535 Prevent static electricity sparks or arcs when adding liquids to a dip tank.**

**You must:**

- Make sure any portable container used to add liquid to the tank is:
  - Electrically bonded to the dip tank
  - Positively grounded.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45535, filed 5/6/03, effective 8/1/03.]

#### **WAC 296-307-45540 Control ignition sources.**

**You must:**

- (1) Make sure the vapor areas and adjacent areas do not have any:
  - Open flames
  - Spark producing devices
  - Heated surfaces hot enough to ignite vapors.

- (2) Use explosion-proof wiring and equipment in the vapor area.

**Reference:** Electrical wiring and equipment has to meet the requirements of the applicable hazardous (classified) location. See Hazardous (classified) locations, WAC 296-307-37209.

**You must:**

- (3) Prohibit smoking in any vapor area:
  - Post an easily seen "NO SMOKING" sign near each dip tank.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45540, filed 5/6/03, effective 8/1/03.]

#### **WAC 296-307-45545 Provide safe electrical wiring and equipment where the liquid can drip or splash.**

**You must:**

- Make sure all electrical wiring and equipment in the vapor area is approved for areas that have:
  - Deposits of easily ignited residue
  - Explosive vapor.

**Exemption:** This does not apply to wiring that is:
 

- In rigid conduit, threaded boxes or fittings
- Has no taps, splices, or terminal connections.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45545, filed 5/6/03, effective 8/1/03.]

### Housekeeping

#### **WAC 296-307-45550 Keep the area around dip tanks clear of combustible material and properly dispose of waste.**

**You must:**

- (1) Make sure the area surrounding dip tanks is:
  - Completely free of combustible debris
  - As free of combustible stock as possible.
- (2) Provide approved metal waste cans that are:
  - Used for immediate disposal of rags and other material contaminated with liquids from dipping or coating operations
  - Emptied and the contents properly disposed of at the end of each shift.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45550, filed 5/6/03, effective 8/1/03.]

### Heating Liquid

#### **WAC 296-307-45555 Make sure heating the liquid in your dip tanks does not cause a fire.**

**You must:**

- Keep the temperature of the liquid in the dip tank:
  - Below the liquid's boiling point
  - At least 100°F below the liquid's autoignition temperature.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45555, filed 5/6/03, effective 8/1/03.]

### Heat Drying

#### **WAC 296-307-45560 Make sure a heating system used for drying objects does not cause a fire.**

**You must:**

- Make sure the heating system used in a drying operation that could cause ignition:
  - Has adequate mechanical ventilation that operates before and during the drying operation
  - Shuts down automatically if a ventilating fan fails to maintain adequate ventilation
  - Is installed as required by NFPA 86-1999, Standard for Ovens and Furnaces.

**Note:** Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45560, filed 5/6/03, effective 8/1/03.]

### Conveyors

#### **WAC 296-307-45565 Make sure conveyor systems are safe.**

**You must:**

- Make sure the conveyor system shuts down automatically if:
  - The ventilation system fails to maintain adequate ventilation

**OR**

- There is a fire.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-45565, filed 5/6/03, effective 8/1/03.]

#### **WAC 296-307-460 Additional requirements for dip tanks used for specific processes.**

**Summary.**

**Your responsibility:**

Safeguard employees working with dip tanks used for specific processes

**You must:**

**HARDENING OR TEMPERING**

Meet specific requirements if you use a hardening or tempering tank

*WAC 296-307-46005*

**VAPOR DEGREASING**

Provide additional safeguards for vapor degreasing tanks  
*WAC 296-307-46025*

**SPRAY CLEANING OR DEGREASING**

Control liquid spray over an open surface cleaning or degreasing tank  
*WAC 296-307-46030.*

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-460, filed 5/6/03, effective 8/1/03.]

**Hardening or Tempering**

**WAC 296-307-46005 Meet specific requirements if you use a hardening or tempering tank.**

**You must:**

(1) Provide an automatic fire extinguishing system or an automatic dip tank cover for any hardening and tempering tank that uses flammable or combustible liquids and:

– Holds five hundred gallons (1893 L) or more of liquid

**OR**

– Has twenty-five square feet (2.37 m<sup>2</sup>) or more of liquid surface area.

(2) Prevent fires.

• Make sure hardening and tempering tanks are:  
– **Not** located on or near combustible flooring  
– Located as far away as practical from furnaces  
– Equipped with noncombustible hoods and vents (or equally effective devices) for venting to the outside.  
• Treat vent ducts as flues and keep them away from combustible material, particularly roofs.

(3) Make sure air under pressure is not used to:

• Fill the tank

**OR**

• Agitate the liquid in the tank.

(4) Equip each tank with an alarm that will sound when the temperature is within 50°F (10°C) of the liquid's flashpoint (alarm set point).

(5) Make sure a limit switch shuts down conveyors supplying work to the tank when the temperature reaches the alarm setpoint, if operationally practical.

(6) Have a circulating cooling system if the temperature of the liquid can exceed the alarm set point.

**Note:** The bottom drain of the tank may be combined with the oil circulating system if the requirements for bottom drains in WAC 296-307-45515 are satisfied.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-46005, filed 5/6/03, effective 8/1/03.]

**Vapor Degreasing**

**WAC 296-307-46025 Provide additional safeguards for vapor degreasing tanks.**

**You must:**

(1) Make sure, if the tank has a condenser or a vapor-level thermostat, that it keeps the vapor level at least:

• Thirty-six inches (91 cm) below the top of the tank if the width of the tank is seventy-two inches or more

**OR**

• One-half the tank width below the top of the tank if the tank is less than seventy-two inches wide.

[Title 296 WAC—p. 2532]

(2) Make sure, if you use gas as a fuel to heat the tank liquid, that the combustion chamber is airtight (except for the flue opening) to prevent solvent vapors from entering the air-fuel mixture.

(3) Make sure the exhaust flue:

- Is made of corrosion-resistant material
- Extends to the outside
- Has a draft diverter if mechanical exhaust is used.

(4) Take special precautions to keep solvent vapors from mixing with the combustion air of the heater if chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene or freon) are used in the dip tank.

(5) Keep the temperature of the heating element low enough to keep a solvent or mixture from:

- Decomposing

**OR**

- Generating excessive vapor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-46025, filed 5/6/03, effective 8/1/03.]

**Spray Cleaning or Degreasing**

**WAC 296-307-46030 Control liquid spray over an open surface cleaning or degreasing tank.**

**You must:**

• Control the spray to the greatest extent feasible by:  
– Enclosing the spraying operation as completely as possible

– Using mechanical ventilation to provide enough inward air velocity to prevent the spray from leaving the vapor area.

**Note:** Mechanical baffles may be used to help prevent the discharge of spray.

**Reference:** Spray painting operations are covered in Spray-finishing operations, WAC 296-62-11019.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-10-068, § 296-307-46030, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-465 Definitions.**

**ACGIH:** American Conference of Governmental Industrial Hygienists.

**Adjacent area:** Any area within twenty feet (6.1 m) of a vapor area that is not separated from the vapor area by tight partitions.

**ANSI:** American National Standards Institute.

**Approved:** Approved or listed by a nationally recognized testing laboratory. Refer to Federal Regulation 29 CFR 1910.7, for definition of nationally recognized testing laboratory.

**Autoignition temperature:** The minimum temperature required to cause self-sustained combustion without any other source of heat.

**Combustible liquid:** A liquid having a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). Mixtures with at least ninety-nine percent of their components having flashpoints of 200°F (93.3°C) or higher are not considered combustible liquids.

**Detearing:** A process for removing excess wet coating material from the bottom edge of a dipped or coated object or material by passing it through an electrostatic field.

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**Dip tank:** A container holding a liquid other than plain water that is used for dipping or coating. An object may be immersed (or partially immersed) in a dip tank or it may be suspended in a vapor coming from the tank.

**Flammable liquid:** Any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture.

**Flashpoint:** The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested by any of the measurement methods described in the definition of flashpoint in WAC 296-307-55060.

**Lower flammable limit:** The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent by volume of the material in air (or other oxidant).

**NFPA:** National Fire Protection Association.

**Vapor area:** Any area in the vicinity of dip tanks, their drain boards or associated drying, conveying, or other equipment where the vapor concentration could exceed twenty-five percent of the lower flammable limit (LFL) for the liquid in the tank.

**You:** Means the employer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-465, filed 5/6/03, effective 8/1/03.]

## Part V Welding

### WAC 296-307-475 Welding, cutting, and brazing.

[97-09-013, recodified as § 296-307-475, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-475, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-47501 What definitions apply to this part?** "Welder" and "welding operator" mean any operator of electric or gas welding and cutting equipment.

All other welding terms are defined according to American Welding Society, Terms and Definitions, A3.0-1969.

[97-09-013, recodified as § 296-307-47501, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-47501, filed 10/31/96, effective 12/1/96.]

### WAC 296-307-480 Installation and operation of oxygen fuel gas systems for welding and cutting.

[97-09-013, recodified as § 296-307-480, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-480, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48001 What general requirements apply to oxygen fuel gas systems?** (1) Explosive mixtures of fuel gases and air or oxygen must be guarded against. No accessory that allows air or oxygen to mix with flammable gases prior to use must be allowed unless approved for that purpose.

Exception: Air or oxygen may mix with flammable gases at the burner or in a standard torch.

(2) Acetylene must never be generated, piped (except in approved cylinder manifolds) or used at a pressure in excess of 15 psi gauge pressure or 30 psi absolute pressure. (The 30

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psi absolute pressure limit is intended to prevent unsafe use of acetylene in pressurized chambers such as caissons, underground excavations or tunnel construction.) Using liquid acetylene is prohibited.

Exception: This requirement does not apply to storage of acetylene dissolved in a suitable solvent in cylinders manufactured and maintained according to DOT requirements, or to acetylene for chemical use.

(3) Only approved apparatus such as torches, regulators or pressure-reducing valves, acetylene generators, and manifolds must be used. Replacement tips may be used on approved torches, if the replacement tips are made to the same specifications as the original, or when replacements are used with convertor/adaptors that meet the same specifications.

(4) Before leaving any employee in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems, you must ensure that the employee has received proper instruction and is competent to do the work. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems must be readily available.

[97-09-013, recodified as § 296-307-48001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48003 What requirements apply to portable cylinders?** All portable cylinders used for storing and shipping compressed gases must be constructed and maintained according to DOT regulations.

(1) Compressed gas cylinders must be legibly marked with either the chemical or the trade name of the gas. The marking must be a permanent stencil, stamp, or label. Whenever practical, the marking must be located on the shoulder of the cylinder.

(2) Compressed gas cylinders must have connections that meet the requirements of the American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI B 57.1-1965.

(3) All cylinders with a water weight capacity greater than thirty pounds must have means of connecting a valve protection cap or with a collar or recess to protect the valve.

[97-09-013, recodified as § 296-307-48003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48005 What general requirements apply to storing compressed gas cylinders?** (1) Cylinders must be kept away from radiators and other sources of heat.

(2) Indoors, cylinders must be stored in a well-protected, well-ventilated, dry area, at least twenty feet from highly combustible materials such as oil or excelsior. Cylinders should be stored in assigned places away from elevators, stairs, or gangways. Assigned storage spaces must be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering. All cylinder enclosures must be ventilated.

(3) Empty cylinders must have their valves closed.

(4) Valve protection caps on cylinders designed to accept a cap, must always be in place and hand-tight, except when cylinders are in use or connected for use.

[97-09-013, recodified as § 296-307-48005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48007 How must fuel-gas cylinders be stored?** Cylinders stored indoors, except those in use or attached ready for use, must be limited to a total gas capacity of 2,000 cubic feet or 300 pounds of LP-gas.

(1) Cylinders in excess of 2,000 cubic feet total gas capacity or 300 pounds of LP-gas, must be stored in a separate room or compartment that meets the requirements of 252 (a)(8) and (9) CFR, or cylinders must be kept outside or in a special building. Special buildings, rooms or compartments must be free from open flame for heating or lighting and must be well ventilated. They may also be used for storage of a maximum of 600 pounds of calcium carbide, when contained in metal containers complying with 252 (a)(7)(a) and (b) CFR. Signs should be conspicuously posted in such rooms reading, "Danger—No smoking, matches or open lights," or other equivalent wording.

(2) Acetylene cylinders must be stored valve end up.

[97-09-013, recodified as § 296-307-48007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48009 How must oxygen cylinders be stored?** (1) Oxygen cylinders must not be stored near highly combustible material, especially oil and grease; or near reserve stocks of carbide and acetylene or other fuel-gas cylinders, or near any other substance likely to cause or accelerate fire; or in an acetylene generator compartment.

(2) Oxygen cylinders stored in outside generator houses must be separated from the generator or carbide storage rooms by a noncombustible partition having a fire-resistance rating of at least one hour. This partition must be without openings and must be gastight.

(3) Oxygen cylinders in storage must be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum of 20 feet or by a noncombustible barrier at least five feet high having a fire-resistance rating of at least one-half hour. (Cylinders "in-use," secured to a hand truck or structural member, with regulators, hoses, and torch temporarily removed for security purposes overnight or weekends, are not considered "in-storage.")

(4) Where a liquid oxygen system is to be used to supply gaseous oxygen for welding or cutting and the system has a storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), including unconnected reserves on hand at the site, it must meet the requirements of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

[97-09-013, recodified as § 296-307-48009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48009, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2534]

**WAC 296-307-48011 What general operating procedures apply to working with cylinders and containers?** (1) The numbers and markings stamped into cylinders must not be tampered with.

(2) Cylinders, cylinder valves, couplings, regulators, hose, and apparatus must be kept free from oily or greasy substances. Oxygen cylinders or apparatus must not be handled with oily hands or gloves. A jet of oxygen must never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

(3) Cylinders must be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields must be provided.

(4) No person, other than the gas supplier, may attempt to mix gases in a cylinder. No one, except the owner of the cylinder or person authorized by the owner, may refill a cylinder.

(5) Cylinders must not be placed where they might become part of an electric circuit. Contacts with third rails, trolley wires, etc., must be avoided.

(6) Fuel-gas cylinders must be placed with valve end up whenever they are in use. Liquefied gases must be stored and shipped with the valve end up.

(7) A suitable cylinder truck, chain, or other steadying device must be used to prevent cylinders from being knocked over while in use.

[97-09-013, recodified as § 296-307-48011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48013 What requirements apply to safety devices on cylinders?** (1) Valve-protection caps must not be used for lifting cylinders from one vertical position to another. Bars must not be used under valves or valve-protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; we recommend using warm (not boiling) water. Valve-protection caps are designed to protect cylinder valves from damage.

(2) Cylinders without fixed hand wheels must have keys, handles, or nonadjustable wrenches on valve stems while these cylinders are in service. In multiple cylinder installations only one key or handle is required for each manifold.

(3) No one may tamper with safety devices in cylinders or valves.

(4) Nothing may be placed on top of an acetylene cylinder when in use that may damage the safety device or interfere with the quick closing of the valve.

(5) Where a special wrench is required it must be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench must always be available for immediate use.

(6) Cylinders with leaking fuse plugs or other leaking safety devices should be plainly marked with a warning not to approach them with a lighted cigarette or other source of ignition. You should notify the supplier promptly and follow the supplier's instructions as to their return.

(2007 Ed.)

[97-09-013, recodified as § 296-307-48013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48015 How must cylinders be transported?** (1) When transporting cylinders by a crane or derrick, a cradle, boat, or suitable platform must be used. Slings or electric magnets are prohibited for this purpose. Valve-protection caps, where cylinder is designed to accept a cap, must always be in place.

(2) Unless cylinders are secured on a special truck, regulators must be removed and valve-protection caps, when provided for, must be put in place before cylinders are moved.

(3) When cylinders are transported by powered vehicle they must be secured in a vertical position.

[97-09-013, recodified as § 296-307-48015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48017 How must cylinders be handled?** (1) Cylinders must not be dropped or struck or permitted to strike each other violently.

(2) Cylinders must be handled carefully. Cylinders must not be subjected to rough handling, knocks, or falls that are liable to damage the cylinder, valve or safety devices and cause leakage.

(3) Cylinders must never be used as rollers or supports, whether full or empty.

[97-09-013, recodified as § 296-307-48017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48019 What requirements apply to cylinder valves?** (1) Cylinder valves must be closed before moving cylinders.

(2) Cylinder valves must be closed when work is finished.

(3) Valves of empty cylinders must be closed.

(4) A hammer or wrench must not be used to open cylinder valves. If valves cannot be opened by hand, the supplier must be notified.

(5) Cylinder valves must not be tampered with nor should any attempt be made to repair them. If you have trouble with a cylinder, you should send a report to the supplier indicating the character of the trouble and the cylinder's serial number. You must follow the supplier's instructions on what to do with the cylinder.

(6) Complete removal of the stem from a diaphragm-type cylinder valve must be avoided.

(7) If cylinders are found to have leaky valves or fittings that cannot be stopped by closing of the valve, the cylinders must be taken outdoors away from sources of ignition and slowly emptied.

(8) The cylinder valve must always be opened slowly.

(9) An acetylene cylinder valve must not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.

[97-09-013, recodified as § 296-307-48019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48019, filed 10/31/96, effective 12/1/96.]

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**WAC 296-307-48021 What requirements apply to cylinder regulators?** (1) Unless connected to a manifold, oxygen from a cylinder must first have an oxygen regulator attached to the cylinder valve.

(2) Before connecting a regulator to a cylinder valve, the valve must be opened slightly and closed immediately. The valve must be opened while standing to one side of the outlet; never in front of it. Fuel-gas cylinder valves must not be cracked near other welding work or near sparks, flame, or other possible sources of ignition.

(3) Before a regulator is removed from a cylinder valve, the cylinder valve must be closed and the gas released from the regulator.

(4) Fuel-gas must not be used from cylinders through torches or other devices equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

[97-09-013, recodified as § 296-307-48021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48023 What requirements apply to fuel-gas manifolds?** (1) Manifolds must be approved either separately for each component part or as an assembled unit.

(2) Fuel-gas cylinders connected to one manifold inside a building must be limited to a maximum total capacity of 300 pounds of LP-gas or 3,000 cubic feet of other fuel-gas. More than one such manifold with connected cylinders may be located in the same room if the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(3) Exception: Fuel-gas cylinders connected to one manifold having an aggregate capacity exceeding 300 pounds of LP-gas or 3,000 cubic feet of other fuel-gas must be located outdoors, or in a separate building or room constructed according to 252 (a)(8) and (9) CFR.

(4) Separate manifold buildings or rooms may also be used for the storage of drums of calcium carbide and cylinders containing fuel gases as provided in WAC 296-307-48007. Such buildings or rooms must have no open flames for heating or lighting and must be well ventilated.

(5) High-pressure fuel-gas manifolds must have approved pressure regulating devices.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-48023, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-48023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48023, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48025 What requirements apply to high pressure oxygen manifolds?** This section applies to cylinders with a DOT service pressure above 200 psig.

(1) Manifolds must be approved either separately for each component or as an assembled unit.

(2) Oxygen manifolds must not be located in an acetylene generator room. Oxygen manifolds must be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

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(3) Oxygen cylinders connected to one manifold must be limited to a total gas capacity of 6,000 cubic feet. More than one such manifold with connected cylinders may be located in the same room if the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(4) Exception: An oxygen manifold, to which cylinders having an aggregate capacity of more than 6,000 cubic feet of oxygen are connected, should be located outdoors or in a separate noncombustible building. Such a manifold, if located inside a building having other occupancy, must be located in a separate room of noncombustible construction having a fire-resistance rating of at least one-half hour or in an area with no combustible material within 20 feet of the manifold.

(5) An oxygen manifold or oxygen bulk supply system that has storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 psia and 70°F), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 psia and 70°F), including unconnected reserves on hand at the site, must meet the requirements of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

(6) High-pressure oxygen manifolds must have approved pressure-regulating devices.

[97-09-013, recodified as § 296-307-48025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48025, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48027 What requirements apply to low pressure oxygen manifolds?** This section applies to cylinders with a maximum DOT service pressure of 200 psig.

(1) Manifolds must be of substantial construction suitable for use with oxygen at a pressure of 250 psig. They must have a minimum bursting pressure of 1,000 psig and must be protected by a safety-relief device that will relieve at a maximum pressure of 500 psig.

Note: DOT-4L200 cylinders have safety devices that relieve at a maximum pressure of 250 psig (or 235 psig if vacuum insulation is used).

(2) Hose and hose connections subject to cylinder pressure must meet the requirements of WAC 296-307-48049. Hose must have a minimum bursting pressure of 1,000 psig.

(3) The assembled manifold including leads must be tested and proven gas-tight at a pressure of 300 psig. The fluid used for testing oxygen manifolds must be oil-free and not combustible.

(4) The location of manifolds must meet the requirements of WAC 296-307-48025.

(5) The following sign must be conspicuously posted at each manifold:

Low-Pressure Manifold  
Do Not Connect High-Pressure Cylinders  
Maximum Pressure—250 PSIG

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-48027, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-48027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48027, filed 10/31/96, effective 12/1/96.]

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**WAC 296-307-48029 What requirements apply to manifolding portable outlet headers?** (1) Portable outlet headers must not be used indoors except for temporary service where the conditions preclude a direct supply from outlets located on the service piping system.

(2) Each outlet on the service piping from which oxygen or fuel-gas is withdrawn to supply a portable outlet header must have a readily accessible shut-off valve.

(3) Hose and hose connections used for connecting the portable outlet header to the service piping must meet the requirements of WAC 296-307-48051.

(4) Master shut-off valves for both oxygen and fuel-gas must be provided at the entry end of the portable outlet header.

(5) Portable outlet headers for fuel-gas service must have an approved hydraulic back-pressure valve installed at the inlet and preceding the service outlets, unless an approved pressure-reducing regulator, an approved backflow check valve, or an approved hydraulic back-pressure valve is installed at each outlet. Outlets provided on headers for oxygen service may be fitted for use with pressure-reducing regulators or for direct hose connection.

(6) Each service outlet on portable outlet headers must have a valve assembly that includes a detachable outlet seal cap, chained or otherwise attached to the body of the valve.

(7) Materials and fabrication procedures for portable outlet headers must comply with WAC 296-307-48033, 296-307-48035, and 296-307-48041.

(8) Portable outlet headers must have frames that will support the equipment securely in the correct operating position and protect them from damage during handling and operation.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-48029, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-48029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48029, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48031 What operating procedures apply to cylinder manifolds?** (1) Cylinder manifolds must be installed under the supervision of someone familiar with the proper practices of construction and use.

(2) All component parts used in the methods of manifolding described in WAC 296-307-48023 must have the materials, design and construction approved either separately or as an assembled unit.

(3) All manifolds and parts used in methods of manifolding must be used only for the gas or gases for which they are approved.

(4) When acetylene cylinders are coupled, approved flash arresters must be installed between each cylinder and the coupler block. For outdoor use only, and when the number of cylinders coupled does not exceed three, one flash arrester installed between the coupler block and regulator is acceptable.

(5) Each fuel-gas cylinder lead should have a backflow check valve.

(6) The maximum aggregate capacity of fuel-gas cylinders connected to a portable manifold inside a building must be 3,000 cubic feet of gas.

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(7) Acetylene and liquefied fuel-gas cylinders must be manifolded vertically.

(8) The pressure in the gas cylinders connected to and discharged simultaneously through a common manifold must be approximately equal.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48031, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-48031, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48031, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48033 How must service piping systems be designed?** (1) Piping and fittings must comply with Section 2, Industrial Gas and Air Piping Systems, of the American National Standard Code for Pressure Piping, ANSI B 31.1-1967, if they do not conflict with subsections (2) and (3) of this section.

(2) Pipe must be at least Schedule 40 and fittings must be at least standard weight in sizes up to and including 6-inch nominal.

(3) Copper tubing must be Types K or L according to the Standard Specification for Seamless Copper Water Tube, ASTM B88-66a.

(4) Piping must be steel, wrought iron, brass or copper pipe, or seamless copper, brass or stainless steel tubing, except as provided in subsections (5) through (9) of this section.

(5) Oxygen piping and fittings at pressures in excess of 700 psig, must be stainless steel or copper alloys.

(6) Hose connections and hose complying with WAC 296-307-48051 may be used to connect the outlet of a manifold pressure regulator to piping if the working pressure of the piping is 250 psig or less and the length of the hose is a maximum of 5 feet. Hose must have a minimum bursting pressure of 1,000 psig.

(7) When oxygen is supplied to a service piping system from a low-pressure oxygen manifold without an intervening pressure regulating device, the piping system must have a minimum design pressure of 250 psig. A pressure regulating device must be used at each station outlet when the connected equipment is for use at pressures less than 250 psig.

(8) Piping for acetylene or acetylenic compounds must be steel or wrought iron.

(9) Unalloyed copper must only be used for acetylene or acetylenic compounds in listed equipment.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48033, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-48033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48035 What requirements apply to piping joints?** (1) Joints in steel or wrought iron piping must be welded, threaded or flanged. Fittings, such as ells, tees, couplings, and unions, must be rolled, forged or cast steel, malleable iron or nodular iron. Gray or white cast iron fittings are prohibited.

(2) Joints in brass or copper pipe must be welded, brazed, threaded, or flanged. Socket type joints must be brazed with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

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(3) Joints in seamless copper, brass, or stainless steel tubing must be approved gas tubing fittings or the joints must be brazed. Socket type joints must be brazed with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

[97-09-013, recodified as § 296-307-48035, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48035, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48037 How must service piping systems be installed?** (1) Distribution lines must be installed and maintained in a safe operating condition.

(2) Piping may be above or below ground. All piping must be run as directly as practical, protected against physical damage, with an allowance for expansion and contraction, jarring and vibration. Pipe laid underground in earth must be below the frost line and protected against corrosion. After assembly, piping must be thoroughly blown out with air or nitrogen to remove foreign materials. For oxygen piping, only oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used.

(3) Only piping that has been welded or brazed must be installed in tunnels, trenches or ducts. Shut-off valves must be located outside such conduits. Oxygen piping may be placed in the same tunnel, trench or duct with fuel-gas pipelines, if there is good natural or forced ventilation.

(4) Low points in piping carrying moist gas must be drained into drip pots constructed to permit pumping or draining out the condensate at necessary intervals. Drain valves must be installed for this purpose having outlets normally closed with screw caps or plugs. Open end valves or petcocks are prohibited, except that in drips located outdoors, underground, and not readily accessible, valves may be used at such points if they have means to secure them in the closed position. Pipes leading to the surface of the ground must be cased or jacketed where necessary to prevent loosening or breaking.

(5) Gas cocks or valves must be provided for all buildings at points where they will be readily accessible for shutting off the gas supply to these buildings in any emergency. Underground valve boxes or manholes should be avoided wherever possible. There must be a shut-off valve in the discharge line from the generator, gas holder, manifold or other source of supply.

(6) Shut-off valves must not be installed in safety-relief lines in such a manner that the safety-relief device can be rendered ineffective.

(7) Fittings and lengths of pipe must be examined internally before assembly and, if necessary, freed from scale or dirt. Oxygen piping and fittings must be washed out with a suitable solution that will effectively remove grease and dirt but will not react with oxygen.

Note: Hot water solutions of caustic soda or trisodium phosphate are effective for this purpose.

(8) Piping must be thoroughly blown out after assembly to remove foreign materials. For oxygen piping, oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used. For other piping, air or inert gas may be used.

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(9) When flammable gas lines or other parts of equipment are being purged of air or gas, open lights or other sources of ignition are prohibited near uncapped openings.

(10) No welding or cutting must be performed on an acetylene or oxygen pipeline, including the attachment of hangers or supports, until the line has been purged. Only oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used to purge oxygen lines.

[97-09-013, recodified as § 296-307-48037, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48037, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48039 How must service piping systems be painted and marked?** (1) Underground pipe and tubing and outdoor ferrous pipe and tubing must be covered or painted with a suitable material for protection against corrosion.

(2) Aboveground piping systems must be marked according to the American National Standard Scheme for the Identification of Piping Systems, ANSI A 13.1-1956.

(3) Station outlets must be marked to indicate the name of the gas.

[97-09-013, recodified as § 296-307-48039, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48039, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48041 How must service piping systems be tested?** (1) Piping systems must be tested and proved gastight at 1-1/2 times the maximum operating pressure, and must be thoroughly purged of air before being placed in service. The material used for testing oxygen lines must be oil free and noncombustible. Flames must not be used to detect leaks.

(2) When flammable gas lines or other parts of equipment are being purged of air or gas, sources of ignition are prohibited near uncapped openings.

[97-09-013, recodified as § 296-307-48041, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48041, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48043 How must equipment be installed?** Equipment shall be installed and used only in the service for which it is approved and as recommended by the manufacturer.

[97-09-013, recodified as § 296-307-48043, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48043, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48045 How must service piping systems be protected?** Service piping systems must be protected by pressure relief devices set to function at not more than the design pressure of the systems and discharging upwards to a safe location.

[97-09-013, recodified as § 296-307-48045, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48045, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48047 What requirements apply to piping protective equipment?** (1) The fuel-gas and oxygen piping systems, including portable outlet headers must incorporate the protective equipment shown in Figures V-1, V-2, and V-3.

When only a portion of a fuel-gas system is to be used with oxygen, only that portion must meet this requirement.

(2) Approved protective equipment (designated PF in Figs. V-1, V-2, and V-3) must be installed in fuel-gas piping to prevent:

- (a) Backflow of oxygen into the fuel-gas supply system;
- (b) Passage of a flash back into the fuel-gas supply system; and
- (c) Excessive back pressure of oxygen in the fuel-gas supply system. The three functions of the protective equipment may be combined in one device or may be provided by separate devices.

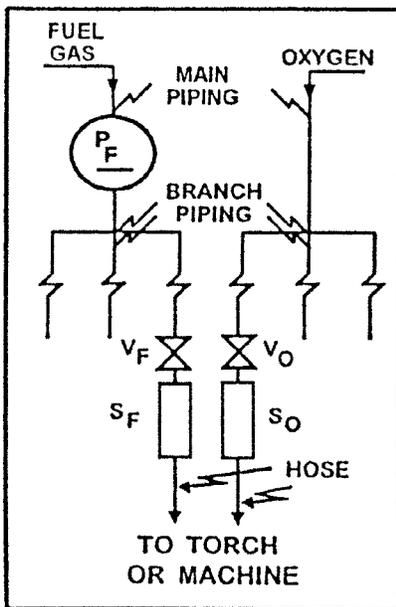


Fig. 1

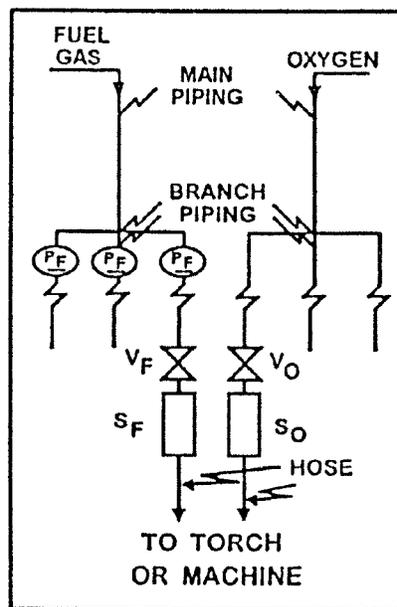


Fig. 2

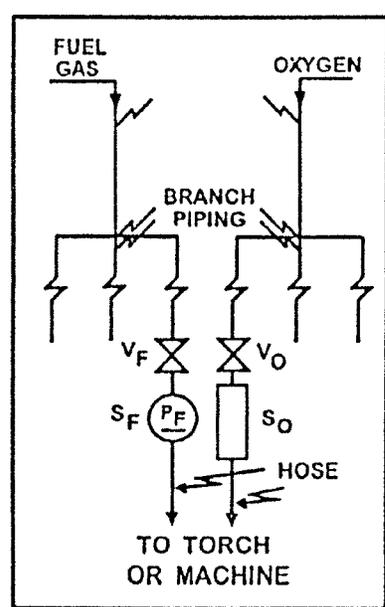


Fig. 3

PF = Protective equipment in fuel-gas piping  
 VF = Fuel-gas station outlet valve  
 VO = Oxygen station outlet valve  
 SF = Backflow prevention device(s) at fuel-gas station outlet  
 SO = Backflow prevention device(s) at oxygen station outlet

(3) The protective equipment must be located in the main supply line, as in Figure 1 or at the head of each branch line, as in Figure 2 or at each location where fuel-gas is withdrawn, as in Figure 3. Where branch lines are of 2-inch pipe size or larger or of substantial length, protective equipment (designated as PF) shall be located as shown in either 2 or 3.

(4) Backflow protection must be provided by an approved device that will prevent oxygen from flowing into the fuel-gas system or fuel from flowing into the oxygen system (see SF, Figs. 1 and 2).

(5) Flash-back protection must be provided by an approved device that will prevent flame from passing into the fuel-gas system.

(6) Back-pressure protection must be provided by an approved pressure-relief device set at a pressure not greater than the pressure rating of the backflow or the flashback protection device, whichever is lower. The pressure-relief device must be located on the downstream side of the backflow and flashback protection devices. The vent from the pressure-relief device must be at least as large as the relief device inlet and must be installed without low points that may collect moisture. If low points are unavoidable, drip pots with drains closed with screw plugs or caps shall be installed at the low points. The vent terminus must not endanger personnel or property through gas discharge; must be located away from ignition sources; and must terminate in a hood or bend.

(7) If pipeline protective equipment incorporates a liquid, the liquid level must be maintained, and a suitable anti-freeze may be used to prevent freezing.

(8) Fuel-gas for use with equipment not requiring oxygen must be withdrawn upstream of the piping protective devices.

[97-09-013, recodified as § 296-307-48047, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48047, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48049 What requirements apply to station outlet protective equipment?** (1) A check valve pressure regulator, hydraulic seal, or combination of these devices must be provided at each station outlet, including those on portable headers, to prevent backflow, as shown in Figures 1, 2, and 3 and designated as SF and SO.

(2) When approved pipeline protective equipment (designated PF) is located at the station outlet as in Figure 3, no additional check valve, pressure regulator, or hydraulic seal is required.

(3) Each station outlet must have a shut-off valve (designated VF and VO) installed on the upstream side of other station outlet equipment.

(4) If the station outlet is equipped with a detachable regulator, the outlet must terminate in a union connection that meets the requirements of the Regulator Connection Standards, 1958, Compressed Gas Association.

(5) If the station outlet is connected directly to a hose, the outlet must terminate in a union connection that meets the

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requirements of the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(6) Station outlets may terminate in pipe threads to which permanent connections are to be made, such as to a machine.

(7) Station outlets must have a detachable outlet seal cap secured in place. This cap must be used to seal the outlet except when a hose, a regulator, or piping is attached.

(8) Where station outlets are equipped with approved backflow and flashback protective devices, as many as four torches may be supplied from one station outlet through rigid piping, if each outlet from such piping, is equipped with a shut-off valve and if the fuel-gas capacity of any one torch does not exceed 15 cubic feet per hour. This rule does not apply to machines.

[97-09-013, recodified as § 296-307-48049, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48049, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48051 What requirements apply to hose and hose connections?** (1) Hose for oxy-fuel gas service must meet the requirements of the Specification for Rubber Welding Hose, 1958, Compressed Gas Association and Rubber Manufacturers Association.

(2) The generally recognized colors are red for acetylene and other fuel-gas hose, green for oxygen hose, and black for inert-gas and air hose.

(3) When parallel lengths of oxygen and acetylene hose are taped together for convenience and to prevent tangling, a maximum of 4 inches out of 12 inches must be covered by tape.

(4) Hose connections must meet the requirements of the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(5) Hose connections must be clamped or otherwise securely fastened so they will withstand, without leakage, twice the pressure to which they are normally subjected in service, but never less than a pressure of 300 psi. Oil-free air or an oil-free inert gas must be used for the test.

(6) Hose showing leaks, burns, worn places, or other defects rendering it unfit for service must be repaired or replaced.

[97-09-013, recodified as § 296-307-48051, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48051, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48053 What requirements apply to pressure-reducing regulators?** (1) Pressure-reducing regulators must be used only for the gas and pressures for which they are intended. The regulator inlet connections must meet the requirements of the Regulator Connection Standards, 1958, Compressed Gas Association.

(2) When regulators or parts of regulators, including gauges, need repair, the work must be performed by skilled mechanics who have been properly instructed.

(3) Gauges on oxygen regulators must be marked "USE NO OIL."

(4) Union nuts and connections on regulators must be inspected before use to detect faulty seats that may cause leakage of gas when the regulators are attached to the cylinder valves. Damaged nuts or connections must be destroyed.

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**WAC 296-307-485 Installation and operation of resistance welding equipment.**

[97-09-013, recodified as § 296-307-485, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-485, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48501 What general requirements apply to resistance welding equipment?** (1) All equipment must be installed by a qualified electrician according to the requirements of chapter 296-307 WAC Part T. There must be a safety-type disconnecting switch or a circuit breaker or circuit interrupter to open each power circuit to the machine, conveniently located at or near the machine, so that the power can be shut off when the machine or its controls are to be serviced.

(2) Ignitron tubes used in resistance welding equipment must have a thermal protection switch.

(3) Employees designated to operate resistance welding equipment must have been properly instructed and judged competent to operate such equipment.

(4) Controls of all automatic or air and hydraulic clamps must be arranged or guarded to prevent the operator from accidentally activating them.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-48501, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-48501, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48501, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48503 What requirements apply to portable welding machines?** (1) All portable welding guns must have suitable counter-balanced devices for supporting the guns, including cables, unless the design of the gun or fixture makes counterbalancing impractical or unnecessary.

(2) All portable welding guns, transformers, and related equipment that is suspended from overhead structures, eye beams, or trolleys must have safety chains or cables. Safety chains or cables shall be able to support the total shock load in the event of failure of any component of the supporting system.

(3) When trolleys are used to support portable welding equipment, they must have suitable forged steel clevis for the attachment of safety chains. Each clevis must be able to support the total shock load of the suspended equipment in the event of trolley failure.

(4) All initiating switches, including retraction and dual schedule switches, located on the portable welding gun must have suitable guards able to prevent accidental initiation through contact with fixturing, operator's clothing, etc. Initiating switch voltage must be a maximum of 24 volts.

(5) The movable holder, where it enters the gun frame, must have enough clearance to prevent the shearing an operator's fingers if placed on the operating movable holder.

(6) The secondary and case of all portable welding transformers must be grounded. Secondary grounding may be by center tapped secondary or by a center tapped grounding reactor connected across the secondary.

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[97-09-013, recodified as § 296-307-48503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48505 What requirements apply to flash welding equipment?** (1) Flash welding machines must have a hood to control flying flash. In cases of high production, where materials may contain a film of oil and where toxic elements and metal fumes are given off, ventilation must be provided according to WAC 296-307-50009 through 296-307-50029.

(2) For the protection of the operators of nearby equipment, fire-resistant curtains or suitable shields must be set up around the machine and in such a manner that the operator's movements are not hampered.

(3) If the welding process cannot be isolated, anyone who may be exposed to the hazard of arc flash must be properly protected.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-48505, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-48505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48505, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48507 Who must perform a job hazard analysis?** A qualified person must perform a job hazard analysis on the operations to be performed on each welding machine to determine the safeguards and personal protective equipment that shall be used for each job.

[97-09-013, recodified as § 296-307-48507, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48507, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-48509 What maintenance requirements apply to resistance welding equipment?** Qualified maintenance personnel must periodically inspect the equipment and maintain records of the inspections. The operator must be instructed to report any equipment defects to the supervisor and the use of the equipment must be discontinued until safety repairs have been completed.

[97-09-013, recodified as § 296-307-48509, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48509, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-490 Application, installation, and operation of arc welding and cutting equipment.**

[97-09-013, recodified as § 296-307-490, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-490, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49001 What environmental conditions must be taken into account when selecting arc welding equipment?**

Note: You may ensure that your equipment is designed for safety by choosing equipment that complies with the Requirements for Electric Arc-Welding Apparatus, NEMA EW-1-1962, National Electrical Manufacturers Association or the Safety Standard for Transformer-Type Arc-Welding Machines, ANSI C33.2-1956, Underwriters' Laboratories.

(1) Standard machines for arc welding service must be designed and constructed to carry their rated load with rated temperature rises where the temperature of the cooling air is

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a maximum of 40°C (104°F) and where the altitude is a maximum of 3,300 feet, and must be suitable for operation in atmospheres containing gases, dust, and light rays produced by the welding arc.

(2) When exposed to the following or other conditions, machines must be designed to safely meet the requirements of the service.

- Unusually corrosive fumes;
- Steam or excessive humidity;
- Excessive oil vapor;
- Flammable gases;
- Abnormal vibration or shock;
- Excessive dust;
- Weather;
- Unusual seacoast or shipboard conditions.

[97-09-013, recodified as § 296-307-49001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49003 What voltages must arc welding equipment use?** Open circuit (no load) voltages of arc welding and cutting machines should be as low as possible consistent with satisfactory welding or cutting being done. Following are the maximum limits:

- (1) For alternating-current machines:
  - (a) Manual arc welding and cutting—80 volts.
  - (b) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (2) For direct-current machines:
  - (a) Manual arc welding and cutting—100 volts.
  - (b) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (3) When special welding and cutting processes require values of open circuit voltages higher than the above, means must be provided to prevent the operator from making accidental contact with the high voltage by adequate insulation or other means.

Note: For a.c. welding under wet conditions or warm surroundings where perspiration is a factor, the use of reliable automatic controls for reducing no load voltage is recommended to reduce the shock hazard.

[97-09-013, recodified as § 296-307-49003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49005 How must arc welding equipment be designed?** (1) A controller integrally mounted in an electric motor driven welder must be able to carry the rated motor current, must be able to make and interrupt stalled rotor current of the motor, and may serve as the running over-current device if provided with the number of over-current units as specified by chapter 296-307 WAC Part T. Starters with magnetic undervoltage release should be used with machines installed more than one to a circuit to prevent circuit overload caused by simultaneously starting several motors upon return of voltage.

(2) On all types of arc welding machines, control apparatus must be enclosed except for the operating wheels, levers, or handles.

Note: Control handles and wheels should be large enough to be easily grasped by a gloved hand.

(3) Input power terminals, tap change devices, and live metal parts connected to input circuits must be completely enclosed and accessible only by tools.

(4) Terminals for welding leads should be protected from accidental electrical contact by employees or by metal objects i.e., vehicles, crane hooks, etc. You may provide protection with:

- Dead-front receptacles for plug connections;
- Recessed openings with nonremovable hinged covers;
- Heavy insulating sleeving or taping; or
- Other equivalent electrical and mechanical protection.

If a welding lead terminal that is intended to be used exclusively for connection to the work is connected to the grounded enclosure, it must be done by a conductor at least two AWG sizes smaller than the grounding conductor and the terminal must be marked to indicate that it is grounded.

(5) No connections for portable control devices (such as push buttons to be carried by the operator) must be connected to an a.c. circuit of higher than 120 volts. Exposed metal parts of portable control devices operating on circuits above 50 volts must be grounded by a grounding conductor in the control cable.

(6) Auto transformers or a.c. reactors must not be used to draw welding current directly from any a.c. power source having a voltage exceeding 80 volts.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-49005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-49005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49007 How must arc welding equipment be installed?** Arc welding equipment, including the power supply, must be installed according to the requirements of chapter 296-307 WAC Part T.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-49007, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-49007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49009 How must arc welding equipment be grounded?** (1) The frame or case of the welding machine (except engine-driven machines) must be grounded according to the requirements of chapter 296-307 WAC Part T.

(2) Conduits containing electrical conductors must not be used for completing a work-lead circuit. Pipelines must not be used as a permanent part of a work-lead circuit, but may be used during construction, extension or repair if current is not carried through threaded joints, flanged bolted joints, or caulked joints and special precautions are used to avoid sparking at connection of the work-lead cable.

(3) Using chains, wire ropes, cranes, hoists, and elevators to carry welding current is prohibited.

(4) Where a structure, conveyor, or fixture is regularly used as a welding current return circuit, joints must be bonded or provided with adequate current collecting devices and appropriate periodic inspection should be conducted to ensure that no electrocution, shock, or fire hazard exists.

(5) All ground connections must be checked to determine that they are mechanically strong and electrically adequate for the required current.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-49009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49011 What requirements apply to supply connections and conductors?** (1) A disconnecting switch or controller must be provided at or near each welding machine without a switch or controller mounted as an integral part of the machine. The switch must meet the requirements of chapter 296-307 WAC Part T. Overcurrent protection must be provided as specified in chapter 296-307 WAC Part T. A disconnect switch with overload protection or equivalent disconnect and protection means, permitted by chapter 296-307 WAC Part T must be provided for each outlet intended for connection to a portable welding machine.

(2) For individual welding machines, the rated current-carrying capacity of the supply conductors must be at least that of the rated primary current of the welding machines.

(3) For groups of welding machines, the rated current-carrying capacity of conductors may be less than the sum of the rated primary currents of the welding machines supplied. The conductor rating must be determined according to the machine loading based on the use to be made of each welding machine and the allowance permissible in the event that all the welding machines supplied by the conductors will not be in use at the same time.

(4) In operations involving several welders on one structure, d.c. welding process requirements may require the use of both polarities; or supply circuit limitations for a.c. welding may require distribution of machines among the phases of the supply circuit. In such cases, no load voltages between electrode holders will be two times normal in d.c. or 1, 1.4, 1.73, or 2 times normal on a.c. machines. Similar voltage differences will exist if both a.c. and d.c. welding are done on the same structure.

(a) All d.c. machines must be connected with the same polarity.

(b) All a.c. machines must be connected to the same phase of the supply circuit and with the same instantaneous polarity.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49011, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-49011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49013 How must arc welding equipment be operated?** (1) Employees assigned to operate or maintain arc welding equipment must be acquainted with the requirements of WAC 296-307-490, 296-307-495, and 296-307-500; if doing gas-shielded arc welding, also Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.

(2) Before starting operations, all connections to the machine must be checked to make certain they are properly made. The work lead must be firmly attached to the work; magnetic work clamps shall be freed from adherent metal

particles of spatter on contact surfaces. Coiled welding cable must be spread out before use to avoid serious overheating and damage to insulation.

(3) You must ensure that the welding machine frame grounding is checked with special attention given to safety ground connections of portable machines.

(4) Cylinders must be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits. Any practice such as the tapping of an electrode against a cylinder to strike an arc is prohibited.

(5) There must be no leaks of cooling water, shielding gas or engine fuel.

(6) You must ensure that the machine has proper switching equipment for shutting down.

(7) Printed rules and instructions covering operation of equipment supplied by the manufacturers must be strictly followed.

(8) Electrode holders when not in use must be placed so that they cannot make electrical contact with persons, conducting objects, fuel or compressed gas tanks.

(9) Cables with splices within 10 feet of the holder are prohibited. The welder should not coil or loop welding electrode cable around parts of the body.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49013, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-49013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49015 How must arc welding equipment be maintained?** (1) The operator should report any equipment defect or safety hazard to the supervisor and discontinue using the equipment until its safety is ensured. Repairs must be made only by qualified persons.

(2) Machines that have become wet must be thoroughly dried and tested before being used.

(3) Work and electrode lead cables should be frequently inspected for wear and damage. Cables with damaged insulation or exposed bare conductors must be replaced. Lengths of work and electrode cables must be joined by connecting means specifically intended for the purpose. The connecting means must have insulation adequate for the service conditions.

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#### **WAC 296-307-495 Fire prevention and protection.**

[97-09-013, recodified as § 296-307-495, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-495, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49501 What basic fire prevention precautions must be taken?** For more information on these basic precautions and the special precautions of WAC 296-307-49503, including fire protection and prevention responsibilities of welders, cutters, their supervisors (including outside contractors), and management, see the Standard for Fire Prevention in Use of Cutting and Welding Processes, NFPA Standard 51B, 1962.

The basic precautions for fire prevention in welding or cutting work are:

(1) If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity must be taken to a safe place.

(2) If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards must be used to confine the heat, sparks, and slag, and to protect the fire hazards.

(3) If the requirements of this section cannot be met, then welding and cutting are prohibited.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49501, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-49501, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49501, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49503 What special fire prevention precautions must be taken?** When the nature of the work to be performed falls within the scope of WAC 296-307-49501(2), certain additional precautions may be necessary:

(1) Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions must be taken so that no readily combustible materials on the floor below will be exposed to sparks that drop through. The same precautions must be observed with regard to cracks or holes in walls, open doorways, and open or broken windows.

(2) Suitable fire extinguishing equipment must be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose, or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

(3) The following requirements apply to fire watch:

(a) Fire watchers are required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

(i) Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation.

(ii) Appreciable combustibles are more than 35 feet away but are easily ignited by sparks.

(iii) Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

(iv) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

(b) Fire watchers must have fire extinguishing equipment readily available and be trained in its use. They must be familiar with facilities for sounding an alarm in the event of a fire. They must watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch must be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

(4) Before cutting or welding is permitted, the area must be inspected by the individual responsible for authorizing cutting and welding operations. The responsible individual must designate precautions to be followed in granting authorization to proceed, preferably in the form of a written permit.

(5) Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor must be swept clean for a radius of 35 feet. Combustible floors must be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, employees operating arc welding or cutting equipment must be protected from possible shock.

(6) Cutting and welding are prohibited in the following situations:

(a) In areas not authorized by management.

(b) In sprinklered buildings while such protection is impaired.

(c) In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or where explosive atmospheres may develop inside uncleaned or improperly prepared tanks or equipment that have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

(d) In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulphur, baled paper, or cotton.

(7) Where practical, all combustibles must be relocated at least 35 feet from the worksite. Where relocation is impractical, combustibles must be protected with flame-proofed covers or otherwise shielded with metal or asbestos guards or curtains. Edges of covers at the floor should be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile.

(8) Ducts and conveyor systems that might carry sparks to distant combustibles must be suitably protected or shut down.

(9) Where cutting or welding is done near walls, partitions, ceiling, or roof of combustible construction, fire-resistant shields or guards must be provided to prevent ignition.

(10) If welding is to be done on a metal wall, partition, ceiling, or roof, precautions must be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work must be provided.

(11) Welding must not be attempted on a metal partition, wall, ceiling, or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

(12) Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs must not be undertaken if the work is close enough to cause ignition by conduction.

(13) You are responsible for the safe use of cutting and welding equipment on your property and:

(a) Based on fire potentials of plant facilities, you must establish areas and procedures for cutting and welding;

(b) You must designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes;

(c) You must insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process; and

(d) You must advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

(14) The supervisor must:

(a) Ensure that cutting and welding equipment is handled and used safely.

(b) Determine the combustible materials and hazardous areas present or likely to be present in the work location.

(c) Protect combustibles from ignition by the following:

(i) Have the work moved to a location free from dangerous combustibles;

(ii) If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition; and

(iii) See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

(d) Secure authorization for the cutting or welding operations from the designated management representative.

(e) Determine that the cutter or welder secures their approval that conditions are safe before going ahead;

(f) Determine that fire protection and extinguishing equipment are properly located at the site; and

(g) Ensure fire watches are available at the site when required.

(15) Cutting or welding is permitted only in areas that are or have been made fire safe. Within the confines of an operating plant or building, cutting and welding should preferably be done in a specific area designed for such work, such as a maintenance shop or a detached outside location. Such areas should be of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas. When work cannot be moved practically, as in most construction work, the area must be made safe by removing combustibles or protecting combustibles from ignition sources.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49503, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-49503, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49503, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49505 What precautions must be taken when welding or cutting containers?** (1) No welding, cutting, or other hot work may be performed on used drums, barrels, tanks or other containers until they have been cleaned thoroughly enough to be certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel must be disconnected or blanked.

(2) All hollow spaces, cavities, or containers must be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

[97-09-013, recodified as § 296-307-49505, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49505, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-49507 What precautions must be taken when welding in confined spaces?** (1) When arc

welding work is stopped for a substantial time, such as during lunch or overnight, all electrodes must be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine be disconnected from the power source.

(2) In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves must be closed and the gas supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practical, the torch and hose must also be removed from the confined space.

[97-09-013, recodified as § 296-307-49507, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49507, filed 10/31/96, effective 12/1/96.]

### **WAC 296-307-500 Protection of employees.**

[97-09-013, recodified as § 296-307-500, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-500, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50001 How must eye protection be selected?** (1) Helmets or hand shields must be used during all arc welding or arc cutting operations, excluding submerged arc welding. Goggles should also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work, and from flying objects. The goggles may have either clear or colored glass, depending on the amount of exposure to adjacent welding operations. Helpers or attendants must have proper eye protection.

(2) Goggles or other suitable eye protection must be used during all gas welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing, or for inspection.

(3) All operators and attendants of resistance welding or resistance brazing equipment must use transparent face shields or goggles, depending on the job, to protect their faces or eyes as required.

(4) Suitable goggles must be provided where needed for brazing operations not above.

[97-09-013, recodified as § 296-307-50001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50003 What specifications must eye protection meet?** (1) Helmets and hand shields must be made of a material that is an insulator for heat and electricity. Helmets, shields and goggles must be not readily flammable and must be able to be sterilized.

(2) Helmets and hand shields must be arranged to protect the face, neck and ears from direct radiant energy from the arc.

(3) Helmets must have filter plates and cover plates designed for easy removal.

(4) All parts must be constructed of a material that will not readily corrode or discolor the skin.

(5) Goggles must be ventilated to prevent fogging of the lenses as much as practical.

(6) Cover lenses or plates should be provided to protect each helmet, hand shield, or goggle filter lens or plate.

(7) All glass for lenses must be tempered, substantially free from scratches, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows must be smooth and parallel.

(8) Lenses must be marked with the source and shade.

(9) Following is a guide to select proper shade numbers. Individual needs may vary.

Welding Operation	Shade No.
Shielded metal-arc welding—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12
Shielded metal-arc welding: 3/16-, 7/32-, 1/4-inch electrodes	12
5/16-, 3/8-inch electrodes	14
Atomic hydrogen welding	10-14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and over	6 or 8

Note: In gas welding or oxygen cutting where the torch produces a high yellow light it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

(10) All filter lenses and plates must meet the test for transmission of radiant energy prescribed in ANSI Z 87.1-1968—American National Standard Practice for Occupational and Educational Eye and Face Protection.

(11) Where the work permits, an arc welder should be enclosed in an individual booth painted with a finish of low-reflectivity such as zinc oxide (an important factor for absorbing ultraviolet radiations) and lamp black, or must be enclosed with noncombustible screens similarly painted. Booths and screens must permit circulation of air at floor level. Employees or other persons adjacent to the welding areas must be protected from the rays by noncombustible or flameproof screens or shields or must be required to wear appropriate goggles.

[97-09-013, recodified as § 296-307-50003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50005 What protective clothing must welders wear?** (1) Employees exposed to the hazards created by welding, cutting, or brazing operations must be protected by personal protective equipment according to the requirements of chapter 296-307 WAC Part H. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

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(2) The following suggestions may be helpful when choosing protective clothing:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, asbestos, or other suitable material may help to protect against radiated heat and sparks.

(c) Woolen clothing is better than cotton because it is less easily ignited and helps to protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves, pockets, or cuffs. Therefore sleeves and collars should be buttoned, and clothing should have no front pockets. Trousers or overalls should be uncuffed.

(e) For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(f) In production work a sheet metal screen in front of the employee's legs can provide further protection against sparks and molten metal in cutting operations.

(g) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(h) For welding and cutting overhead or in extremely confined spaces, ear protection is sometimes desirable.

(i) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors must be used.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50007 What other requirements apply to employee protection?** (1) You must ensure that a welder or helper working on platforms, scaffolds, or runways is protected against falling by using railings, safety belts, life lines, or other equally effective safeguards.

(2) Welders must place welding cable and other equipment so that it is clear of passageways, ladders, and stairways.

[97-09-013, recodified as § 296-307-50007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50009 What employee protection must be provided in confined spaces?** "Confined space" means a relatively small or restricted space such as a tank, boiler, pressure vessel, or small compartment of a ship.

(1) Confined spaces must be ventilated. For ventilation requirements see WAC 296-307-50011 through 296-307-50029.

(2) When welding or cutting in a confined space, the gas cylinders and welding machines must be left outside. Before operations are started, heavy portable equipment mounted on wheels must be securely blocked to prevent accidental movement.

(3) Where a welder must enter a confined space through a manhole or other small opening, means must be provided for quickly removing the welder in case of emergency. When safety belts and lifelines are used, they must be attached so that the welder's body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure must be stationed outside to observe the welder at all times and be able to put rescue operations into effect.

(4) After welding operations are completed, the welder must mark the hot metal or provide some other means of warning other employees.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50011 What general requirements apply to welding ventilation?** (1) The following three factors in arc and gas welding must be considered when determining the amount of contamination to which welders may be exposed:

(a) Dimensions of space in which welding is to be done (especially ceiling height);

(b) Number of welders; and

(c) The possibility of hazardous fumes, gases, or dust according to the metals involved.

(2) Other factors involved may require ventilation or respiratory protective devices as needed to meet the requirements of this section. Such factors include:

(a) Atmospheric conditions;

(b) Heat generated; and

(c) Presence of volatile solvents.

(3) When welding must be performed in a space entirely screened on all sides, the screens must be arranged so that no serious restriction of ventilation exists. The screens should be mounted so that they are about 2 feet above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby employees from the glare of welding.

(4) Local exhaust or general ventilating systems must be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable in chapter 296-62 WAC.

Note: A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. These include but are not limited to the materials itemized in WAC 296-307-50019 through 296-307-50029.

(5) You must determine which potentially hazardous materials are associated with welding and cutting and inform employees through signs, labels or other appropriate means.

(a) Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z 49.1-1967, Safety in Welding and Cutting, published by the American Welding Society.

(b) Brazing (welding) filler metals containing cadmium in significant amounts must carry the following notice on tags, boxes, or other containers:

[Title 296 WAC—p. 2546]

WARNING

CONTAINS CADMIUM—POISONOUS FUMES MAY BE FORMED ON HEATING

- Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators. See ANSI Z 49.1-1967.

- If chest pain, cough, or fever develops after use call physician immediately.

- Keep children away when using.

(c) Brazing and gas welding fluxes containing fluorine compounds must have a cautionary wording to indicate that they contain fluorine compounds. The American Welding Society recommends the following for brazing and gas welding fluxes:

CAUTION

CONTAINS FLUORIDES

This flux when heated gives off fumes that may irritate eyes, nose and throat.

- Avoid fumes. Use only in well-ventilated spaces.

- Avoid contact of flux with eyes or skin.

- Do not take internally.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50011, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50013 What ventilation must be provided for general welding and cutting?** (1) Mechanical ventilation must be provided when welding or cutting is done on metals not covered in WAC 296-307-50019 through 296-307-50029 in the following locations:

(a) In a space of less than 10,000 cubic feet per welder.

(b) In a room with a ceiling height of less than 16 feet.

(c) In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross-ventilation.

(2) Ventilation must be at the minimum rate of 2,000 cubic feet per minute per welder.

Exception: This requirement does not apply where local exhaust hoods and booths that meet the requirements of WAC 296-307-50015, or airline respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations where the restrictions in subsection (1) of this section are not present.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50013, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50015 What requirements apply to local exhaust hoods and booths?** Mechanical local exhaust ventilation may be provided by either of the following:

(1) Freely movable hoods intended to be placed by the welder as near as practical to the work being welded and provided with a rate of airflow sufficient to maintain a velocity in the direction of the hood of 100 linear feet per minute in the zone of welding when the hood is at its most remote dis-

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tance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3-inch wide flanged suction opening are shown in the following table:

Welding zone	Minimum air flow cubic feet/minutes	Duct diameter inches
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3-1/2
8 to 10 inches from arc or torch	425	4-1/2
10 to 12 inches from arc or torch	600	5-1/2

- 1 When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.
- 2 Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.

(2) A fixed enclosure with a top and at least two sides that surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet per minute.

[97-09-013, recodified as § 296-307-50015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50017 What ventilation must be provided in confined spaces?** (1) All welding and cutting operations carried on in confined spaces must be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies to welders, helpers, and other employees in the immediate vicinity. All replacement air must be clean and respirable.

(2) In circumstances where it is impossible to provide such ventilation, airline respirators or hose masks approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for this purpose must be used.

(3) In areas immediately hazardous to life, hose masks with blowers or self-contained breathing equipment must be used. The breathing equipment must be approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH).

(4) Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or self-contained breathing equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), an employee must be stationed on the outside of such confined spaces to ensure the safety of those working within.

(5) Oxygen must not be used for ventilation.

[97-09-013, recodified as § 296-307-50017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50019 What requirements apply to welding fluorine compounds?** In confined spaces, welding or cutting involving fluxes, coverings, or other materials that

contain fluorine compounds must be done according to WAC 296-307-50017.

"Fluorine compound" means a compound that contains fluorine as an element in chemical combination, not as a free gas.

Note: The need for local exhaust ventilation or airline respirators for welding or cutting in other than confined spaces will depend on the circumstances. However, such protection is desirable for fixed-location production welding and for all production welding on stainless steels. Where air samples taken at the welding location indicate that the fluorides liberated are below the maximum allowable concentration, such protection is not necessary.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50019, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50019, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50021 What requirements apply to welding zinc?** (1) In confined spaces welding or cutting involving zinc-bearing base or filler metals or metals coated with zinc-bearing materials must be done according to WAC 296-307-50017.

(2) Indoors, welding or cutting involving zinc-bearing base or filler metals coated with zinc-bearing materials must be done according to WAC 296-307-50015.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50021, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50023 What requirements apply to welding lead?** (1) In confined spaces, welding involving lead-base metals (erroneously called lead-burning) must be done according to WAC 296-307-50017.

(2) Indoors, welding involving lead-base metals must be done according to WAC 296-307-50015.

(3) In confined spaces or indoors, welding or cutting involving metals containing lead, other than as an impurity, or involving metals coated with lead-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators. Outdoors, such operations must be done using respiratory protective equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes. In all cases, employees in the immediate vicinity of the cutting operation must be protected as necessary by local exhaust ventilation or airline respirators.

Note: See chapter 296-62 WAC for additional requirements on lead.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50023, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50023, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50025 What requirements apply to welding beryllium?** Welding or cutting indoors, outdoors, or in confined spaces involving beryllium-containing base or filler metals must be done using local exhaust ventilation and airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure

is within the acceptable concentrations defined by WAC 296-307-62625. In all cases, employees in the immediate vicinity of the welding or cutting operations must be protected as necessary by local exhaust ventilation or airline respirators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-50025, filed 12/21/04, effective 4/2/05. 97-09-013, recodified as § 296-307-50025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50025, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50027 What requirements apply to welding cadmium?** (1) Welding or cutting indoors or in confined spaces involving cadmium-bearing or cadmium-coated base metals must be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors, such operations must be done using respiratory protective equipment such as fume respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

(2) Welding (brazing) involving cadmium-bearing filler metals must be done using ventilation as prescribed in WAC 296-307-50015 or 296-307-50017 if the work is to be done in a confined space.

Note: See chapter 296-62 WAC for additional requirements on cadmium.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50027, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-50027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-50029 What requirements apply to welding mercury?** Welding or cutting indoors or in a confined space involving metals coated with mercury-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by WAC 296-307-62625. Outdoors, such operations must be done using respiratory protective equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-50029, filed 12/21/04, effective 4/2/05. 97-09-013, recodified as § 296-307-50029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50029, filed 10/31/96, effective 12/1/96.]

## Part W Powered Industrial Trucks (Forklifts)

**WAC 296-307-520 Powered industrial trucks (forklifts).**

[97-09-013, recodified as § 296-307-520, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-520, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2548]

**WAC 296-307-52001 What does this section cover?** WAC 296-307-520 applies to all powered industrial trucks used in agricultural operations.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52003 What is a "powered industrial truck"?** "Powered industrial truck" (or "truck") means a fork truck, industrial tractor, platform lift truck, motorized hand truck, or other specialized industrial trucks, powered by electric motors or internal combustion engines. The definition does not include compressed gas-operated industrial trucks, tractor-mounted forklifts, or vehicles intended primarily for earth moving or over-the-road hauling.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52003, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52005 What manufacturer's requirements apply to powered industrial trucks?** (1) All powered industrial trucks in use by an employer must meet the applicable requirements of design, construction and stability as defined by the American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks, except for vehicles intended primarily for earth moving or over-the-road hauling. All new powered industrial trucks acquired and used by an employer on or after March 1, 2000, must meet the applicable requirements of design, construction and stability as defined in ASME B56.1-1993. The employer must ensure that all powered industrial trucks are inspected, maintained and operated in accordance with this section and the manufacturer's recommendations and specifications.

(2) Approved trucks must have a label indicating approval by the testing laboratory as meeting the specifications and requirements of ANSI B56.1-1969.

(3) Modifications or additions must only be performed with the manufacturer's prior written approval. When modifications or additions are made, capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

(4) If the truck is equipped with front-end attachments other than factory installed attachments, it must be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with the load centered from side to side.

(5) The user must ensure that all nameplates and markings are in place and legible.

[Statutory Authority: RCW 49.17.010, [49.17.]040 and [49.17.]050. 00-01-176, § 296-307-52005, filed 12/21/99, effective 3/1/00. Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52007 What are the classifications of powered industrial trucks?** Powered industrial trucks are identified according to the following classifications:

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(1) "D" refers to trucks that are diesel engine powered that have minimum safeguards against inherent fire hazards.

(2) "DS" refers to diesel powered trucks that, in addition to meeting all the requirements for the type D trucks, with additional safeguards to the exhaust, fuel, and electrical systems.

(3) "DY" refers to diesel powered trucks that have all the safeguards of the DS trucks; in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.

(4) "E" refers to electrically powered trucks with minimum acceptable safeguards against inherent fire hazards.

(5) "ES" refers to electrically powered trucks that, in addition to all of the requirements for the E trucks, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.

(6) "EE" refers to electrically powered trucks that have, in addition to all of the requirements for the E and ES type trucks, have their electric motors and all other electrical equipment completely enclosed.

(7) "EX" refers to electrically powered trucks that differ from E, ES, or EE type trucks in that the electrical fittings and equipment are so designed, constructed, and assembled to be used in atmospheres containing flammable vapors or dusts.

(8) "G" refers to gasoline powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(9) "GS" refers to gasoline powered trucks with additional safeguards to the exhaust, fuel, and electrical systems.

(10) "LP" refers to liquified petroleum gas-powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(11) "LPS" refers to LP-gas powered trucks that in addition to meeting the requirements for LP trucks, are provided with additional safeguards to the exhaust, fuel, and electrical systems.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52007, filed 12/21/99, effective 3/1/00. 97-09-013, recodified as § 296-307-52007, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52009 What must a user consider before choosing a powered industrial truck?** Before choosing the industrial truck to use, the user must determine whether the atmosphere or location is hazardous or nonhazardous. The type of industrial truck must be chosen according to the requirements of WAC 296-307-52011.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52009, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52011 What requirements determine which trucks to use in specific hazardous environments?** Following are the minimum truck types required in specific hazardous environments. You may choose to use industrial trucks having greater safeguards. Tables W-1 and W-2 give specific vehicle usage information by Group and Class.

TABLE W-1  
SUMMARY TABLE ON USE OF INDUSTRIAL TRUCKS IN VARIOUS LOCATIONS

CLASSES (Description of classes)	GROUPS (Examples of locations or atmosphere in classes and groups)				DIVISIONS (Nature of hazardous conditions)	
UNCLASSIFIED Locations not possessing atmospheres as described in other columns.	No group designations in Unclassified Piers and wharves inside and outside general storage, general industrial or commercial properties				No divisions in Unclassified	
CLASS I LOCATIONS Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.	A Acetylene	B Hydrogen	C Ethyl ether	D Gasoline Naphtha Alcohols Acetone Lacquer solvent Benzene	1 Conditions exists continuously, intermittently, or periodically under normal operating conditions.	2 Condition may occur due to accidentally, for example, due to a puncture of a storage drum.
	E Metal dust		F Carbon black Coal dust Coke dust	G Grain dust Flour dust Starch dust Organic dust	1 Explosive mixture may be present under normal operating conditions, or where failure of equipment may cause the condition to exist simultaneously with arcing or sparking of electrical equipment, or where dusts of an electrically conducting nature may be present.	2 Explosive mixture not normally present, but where deposits of dust may cause heat rise in electrical equipment, or where such deposits may be ignited by arcs or sparks from electrical equipment.
CLASS II LOCATIONS Locations which are hazardous because of the presence of combustible dust.	Class III has no groups				1	2
CLASS III LOCATIONS Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.	Baled waste, cocoa fiber, cotton, excelsior, hemp, istle, jute, kapok, oakum, sisal, Spanish moss, synthetic fibers, tow.				Locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Locations in which easily ignitable fibers are stored or handled (except in the process of manufacture).

TABLE W-2  
 AUTHORIZED USES OF TRUCKS BY TYPES IN GROUPS OF CLASSES AND DIVISIONS

Groups in classes	UN	CLASS I								CLASS II						CLASS III	
	CLASSIFIED	DIV I				DIV II				DIV I			DIV II			DIV I	DIV II
	None	A	B	C	D	A	B	C	D	E	F	G	E	F	G	None	None
Type of truck authorized:																	
<i>Diesel:</i>																	
Type D.....	D**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type DS.....	.....	...	...	...	...	...	...	...	DS...	...	...	...	...	...	DS...	...	DS
Type DY.....	.....	...	...	...	...	...	...	...	DY...	...	...	...	...	...	DY...	DY...	DY
<i>Electric:</i>																	
Type E.....	E**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	E
Type ES.....	.....	...	...	...	...	...	...	...	ES...	...	...	...	...	...	ES...	...	ES
Type EE.....	.....	...	...	...	...	...	...	...	EE...	...	...	...	...	...	EE...	EE...	EE
Type EX.....	.....	...	...	...	EX...	...	...	...	EX...	EX...	EX...	...	...	EX...	EX...	EX...	EX
<i>Gasoline:</i>																	
Type G.....	G**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type GS.....	.....	...	...	...	...	...	...	...	GS...	...	...	...	...	...	GS...	...	GS
<i>LP-Gas:</i>																	
Type LP.....	Lp**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type LPS.....	.....	...	...	...	...	...	...	...	LPS...	...	...	...	...	...	LPS...	...	LPS

\*\*Trucks conforming to these types may also be used.

(1) Powered industrial trucks are prohibited in atmospheres with a hazardous concentration of:

- Acetaldehyde,
- Acetylene,
- Butadiene,
- Cyclopropane,
- Diethyl ether,
- Ethylene,
- Ethylene oxide,
- Hydrogen (or gases or vapors equivalent in hazard to hydrogen, such as manufactured gas),
- Isoprene,
- Propylene oxide, or
- Unsymmetrical dimethyl hydrazine (UDMH).

(a) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres containing hazardous concentrations of metal dust, including:

- Aluminum, magnesium, and their commercial alloys;
- Other dusts of similarly hazardous characteristics; or
- In atmospheres containing:
  - Carbon black,
  - Coal, or
  - Coke dust.

(b) In atmospheres where dust of magnesium, aluminum or aluminum bronze may be present, fuses, switches, motor controllers, and circuit breakers of trucks must have enclosures specifically approved for such locations.

(2) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres containing

- Acetone,
- Acrylonitrile,
- Alcohol,
- Ammonia,
- Benzene,
- Benzol,
- Butane,
- Ethylene dichloride,
- Gasoline,
- Hexane,

- Lacquer solvent vapors,
- Naphtha,
- Natural gas,
- Propane,
- Propylene,
- Styrene,
- Vinyl acetate,
- Vinyl chloride, or
- Xylenes

in quantities sufficient to produce explosive or ignitable mixtures.

(3) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may be used in locations where volatile flammable liquids or flammable gases are handled, processed or used, if the hazardous liquids, vapors or gases are normally confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown, or in case of abnormal equipment operation.

Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may also be used in locations in which hazardous concentrations of gases or vapors are normally prevented by mechanical ventilation but that might become hazardous through failure or abnormal operation of the ventilating equipment.

(4) Only approved DS, ES, GS, or LPS trucks, or other trucks approved by the manufacturer, may be used in locations used for the storage of hazardous liquids in sealed containers or liquefied or compressed gases in containers. This classification includes locations where volatile flammable liquids or flammable gases or vapors are used but are hazardous only in case of an accident or an unusual operation condition.

The quantity of hazardous material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the business's history of explosions or fires are all factors that should be considered in determining which truck has sufficient safeguards for the location.

(a) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres in which combustible dust is or may be suspended in quantities sufficient to produce explosive or ignitable mixtures, or where mechanical failure or abnormal operation of machinery or equipment might cause such mixtures to be produced.

(b) The EX classification, or other trucks approved by the manufacturer as having equal or greater safeguards, usually includes the working areas of:

- Grain handling and storage plants,
- Rooms containing grinders or pulverizers,
- Cleaners,
- Graders,
- Scalpers,
- Open conveyors or spouts,
- Open bins or hoppers,
- Mixers or blenders,
- Automatic or hopper scales,
- Packing machinery,
- Elevator heads and boots,
- Dust and stock collectors (except all-metal collectors

vented to the outside),

and all similar dust producing machinery and equipment in:

- Grain processing plants,
- Starch plants,
- Sugar pulverizing plants,
- Malting plants,
- Hay grinding plants, and other similar locations; and,
- Areas where combustible dust may, under normal

operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

(5) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres in which deposits or accumulations of combustible dust may be ignited by arcs or sparks from the truck, if combustible dust will not normally be suspended or thrown into suspension by the normal operation of equipment or apparatus in quantities sufficient to produce explosive or ignitable mixtures.

(6) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may be used in locations with easily ignitable fibers or flyings if the fibers or flyings are not likely to be suspended in quantities sufficient to produce ignitable mixtures.

(7) Only approved DS, DY, ES, EE, EX, GS, or LPS trucks, or other trucks approved by the manufacturer, may be used in locations, including outside storage, where easily ignitable fibers are stored or handled, but are not processed or manufactured. E trucks that have been previously used in these locations may continue to be used.

(8) If storage warehouses and outside storage locations are hazardous, the specified approved truck, or other truck approved by the manufacturer, must be used. If not classified as hazardous, any approved D, E, G, or LP truck, or other truck approved by the manufacturer, may be used, or trucks meeting the requirements for these types may be used.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52011, filed 12/21/99, effective 3/1/00. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52011, filed 12/1/98, effective

(2007 Ed.)

3/1/99. 97-09-013, recodified as § 296-307-52011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52013 In what environments may converted trucks be used?** When powered industrial trucks that were originally approved to use gasoline are converted to use LP-gas according to WAC 296-307-52047(12), they may be used in locations where G, GS or LP, and LPS trucks are specified.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52013, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52015 What requirements apply to overhead safety guards?** (1) High-lift rider trucks must be fitted with an overhead guard manufactured according to WAC 296-307-52005(1), unless operating conditions do not permit.

(2) An overhead guard must be used as protection against falling objects.

Note: An overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, and other objects involved in the job, but not to withstand the impact of a falling capacity load.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52015, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52017 What requirements apply to load backrests?** (1) A load backrest extension must be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

(2) If the type of load presents a hazard, the user must equip fork trucks with a vertical load backrest extension manufactured according to WAC 296-307-52005(1).

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52017, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52017, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52019 What requirements apply to fuel handling and storage?** (1) You must ensure that liquid fuels such as gasoline and diesel fuel are stored and handled according to NFPA Flammable and Combustible Liquids Code (NFPA No. 30-1996).

(2) You must ensure that LP-gas fuel is stored and handled according to NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1998).

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52019, filed 12/21/99, effective 3/1/00. 97-09-013, recodified as § 296-307-52019, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52019, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52021 What requirements apply to lighting for operating areas?** (1) Adequate lighting should be provided in operating areas. (See ANSI Practice for Industrial Lighting, ANSI/IES RP-7 1990.)

(2) Where general lighting is inadequate, directional lighting must be provided on the truck.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52021, filed 12/21/99, effective 3/1/00. 97-09-013, recodified as § 296-307-52021, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52021, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52023 What level of carbon monoxide gas is allowed?** Concentration levels of carbon monoxide gas created by truck operations must not exceed the levels specified in WAC 296-62-075, Part L (general occupational health standards).

Note: Questions concerning degree of concentration and methods of sampling should be referred to a qualified industrial hygienist.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52023, filed 12/21/99, effective 3/1/00. 97-09-013, recodified as § 296-307-52023, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52023, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52025 What requirements apply to dockboards (bridge plates)?** (1) Portable and powered dockboards must be strong enough to support the load carried on them.

(2) Portable dockboards must be secured in position, either by anchors or anti-slipping devices.

(3) Powered dockboards must meet the design and construction requirements of Commercial Standard CS202-56 (1956) "Industrial Lifts and Hinged Loading Ramps" published by the U.S. Department of Commerce.

(4) Dockboard or bridge plates must be driven over carefully and slowly and their rated capacity never exceeded.

(5) Portable dockboards must have handholds for safe handling.

(6) Railroad cars must be kept stationary while dockboards or bridge plates are in position.

[97-09-013, recodified as § 296-307-52025, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52025, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52027 What rules apply to loading trucks, trailers, and railroad cars with powered industrial trucks?** (1) Wheel stops or other positive protection must be provided to prevent railroad cars from moving during loading or unloading.

(2) Fixed jacks may be necessary to support a semi-trailer and prevent up-ending during loading or unloading if the trailer is not coupled to a tractor.

(3) Many truck-trailers are equipped with a rear-end protection device to prevent cars from wedging underneath during a collision. These protection devices must be used with equipment that secures the truck-trailer to the loading dock. Wheel chocks are not required under the following conditions:

(a) Trucks or trailers are secured to the loading dock with a mechanical system that prevents movement away from the dock during loading, unloading, and boarding.

(b) All of the mechanical equipment is installed, maintained, and used as recommended by the manufacturer.

[Title 296 WAC—p. 2552]

(c) Any damaged mechanical equipment is removed from service immediately and is not used to secure trucks and trailers.

(4) The flooring of trucks, trailers, and railroad cars must be checked for breaks and weakness before use.

[97-09-013, recodified as § 296-307-52027, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52027, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52029 What are the operator training requirements for powered industrial trucks?** (1) **Safe operation.**

(a) The employer must ensure that each powered industrial truck operator is trained in the safe operation of a powered industrial truck, and is competent to operate a powered industrial truck safely.

(b) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer must ensure that each operator has successfully completed the training required by this section.

(2) **Training program implementation.**

(a) Trainees may operate a powered industrial truck only under the direct supervision of persons who have the knowledge, training, and experience to train operators and where such operation does not endanger the trainee or other employees.

Note: The employer, or any other qualified person of the employer's choosing, may give required training and evaluation.

(b) Training must consist of formal instruction and/or practical training, conveyed in a manner that the trainee understands.

Note: Formal instruction may include lecture, discussion, interactive computer learning, video tape and/or written material. Practical training may include demonstrations performed by the trainer and practical exercises performed by the trainee.

(3) **Training program content.** Powered industrial truck operators must receive initial training in the topics that follow, except in topics that the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

(a) Truck-related topics:

- Operating instructions, warnings and precautions for the types of truck the operator will be authorized to operate;
- Differences between the truck and the automobile;
- Truck controls and instrumentation: Where they are located, what they do, and how they work;
- Engine or motor operation;
- Steering and maneuvering;
- Visibility (including restrictions due to loading);
- Fork and attachment adaption, operation, and use limitations;
- Vehicle capacity;
- Vehicle stability;
- Any vehicle inspection and maintenance that the operator will be required to perform;
- Refueling and/or charging and recharging of batteries;
- Operating limitations;

(2007 Ed.)

- Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

(b) Workplace-related topics:

- Surface conditions where the vehicle will be operated;
- Composition of loads to be carried and load stability;
- Load manipulation, stacking, and unstacking;
- Pedestrian traffic in areas where the vehicle will be operated;
- Narrow aisles and other restricted places where the vehicle will be operated;
- Hazardous (classified) locations where the vehicle will be operated;
- Ramps and other sloped surfaces that could affect the vehicle's stability;
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

(4) **Retraining.**

(a) Retraining in relevant topics must be provided to the operator when:

- The operator has been observed to operate the vehicle in an unsafe manner;
- The operator has been involved in an accident or near-miss incident;
- The operator has received an evaluation that reveals that the operator is not operating the truck safely;
- The operator is assigned to drive a different type of truck; or
- The condition in the workplace changes in a manner that could affect safe operation of the truck.

(b) Retraining must be provided to an operator if three years has elapsed since he or she last received training.

(5) **Avoidance of duplicative training.** If an operator has previously received training in a topic specified in subsection (3) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator can provide proof of such training within three years, and the employer can verify operator competency.

(6) **Recordkeeping.** Employers must keep records showing that each operator has been trained or received retraining as required by this section. These records must include the name of the operator, the date of the training or retraining, and the name of the person(s) giving the training or retraining.

(7) **Implementation dates.** The employer must ensure that operators of powered industrial trucks are trained, as appropriate, by the effective date of this section. Employees hired on or after the effective date of this section must be trained and found competent prior to being assigned to operate a powered industrial truck.

(8) **Nonmandatory guidance.** To assist employers in implementing operator training requirements, a nonmandatory appendix has been added as WAC 296-307-52030. This appendix does not add to, alter, or reduce the requirements of this section.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52029, filed 12/21/99, effective 3/1/00. 97-09-013, recodified as § 296-307-52029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52029, filed 10/31/96, effective 12/1/96.]

filed as § 296-307-52029, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52029, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52030 Is there any additional (non-mandatory) information that may assist me with powered industrial truck operator training? (1) Definitions.** The following definitions may help to explain the principle of stability:

**"Center of gravity"** means the point on an object at which all of the object's weight is concentrated. For symmetrical loads, the center of gravity is at the middle of the load.

**"Counterweight"** means the weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.

**"Fulcrum"** means the truck's axis of rotation when it tips over.

**"Grade"** means the slope of a surface, which is usually measured as the number of feet of rise or fall over a hundred foot horizontal distance (the slope is expressed as a percent).

**"Lateral stability"** means a truck's resistance to overturning sideways.

**"Line of action"** means an imaginary vertical line through an object's center of gravity.

**"Load center"** means the horizontal distance from the load's edge (or the fork's or other attachment's vertical face) to the line of action through the load's center of gravity.

**"Longitudinal stability"** means the truck's resistance to overturning forward or rearward.

**"Moment"** means the product of the object's weight times the distance from a fixed point (usually the fulcrum). In the case of a powered industrial truck, the distance is measured from the point at which the truck will tip over to the object's line of action. The distance is always measured perpendicular to the line of action.

**"Track"** means the distance between the wheels on the same axle of the truck.

**"Wheelbase"** means the distance between the centerline of the vehicle's front and rear wheels.

(2) **General.**

(a) Determining the stability of a powered industrial truck is simple once a few basic principles are understood. There are many factors that contribute to a vehicle's stability: The vehicle's wheelbase, track, and height; the load's weight distribution; and the vehicle's counterweight location (if the vehicle is so equipped).

(b) The "stability triangle," used in most stability discussions, demonstrates stability simply (see Figures 1 and 2).

(3) **Basic principles.**

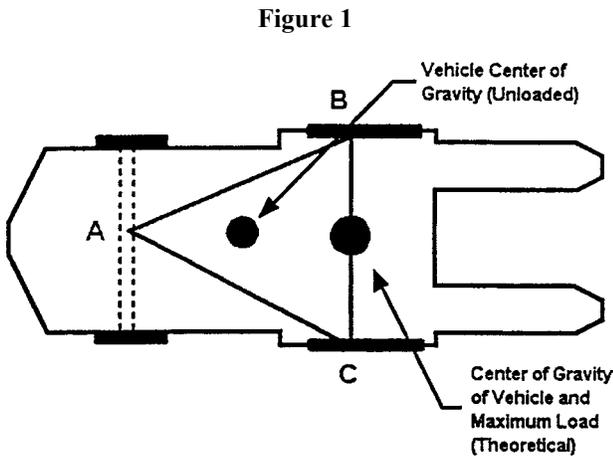
(a) Whether an object is stable depends on the object's "moment" (see definitions, this section) at one end of a system being greater than, equal to, or smaller than the object's moment at the system's other end. This principle can be seen in the way a seesaw or teeter-totter works: That is, if the product of the load and distance from the fulcrum (moment) is equal to the moment at the device's other end, the device is balanced and it will not move. However, if there is a greater moment at one end of the device, the device will try to move downward at the end with the greater moment.

(b) The longitudinal stability of a counterbalanced powered industrial truck depends on the vehicle's moment and the

load's moment. In other words, if the mathematic product of the load-moment (the distance from the front wheels, the approximate point at which the vehicle would tip forward) to the load's center of gravity times the load's weight is less than the vehicle's moment, the system is balanced and will not tip forward. However, if the load's moment is greater than the vehicle's moment, the greater load-moment will force the truck to tip forward.

**(4) The stability triangle.**

(a) Almost all counterbalanced powered industrial trucks have a three-point suspension system, that is, the vehicle is supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When the points are connected with imaginary lines, this three-point support forms a triangle called the stability triangle. Figure 1 depicts the stability triangle.



- Notes:
1. When the vehicle is loaded, the combined center of gravity shifts toward line B-C. Theoretically, the maximum load will result in the center of gravity at the line B-C. In actual practice, the combined center of gravity should never be at line B-C.
  2. The addition of additional counterweight will cause the truck center of gravity to shift toward point A and result in a truck that is less stable laterally.

(b) When the vehicle's line of action, or load center, falls within the stability triangle, the vehicle is stable and will not tip over. However, when the vehicle's line of action or the vehicle/load combination falls outside the stability triangle, the vehicle is unstable and may tip over.

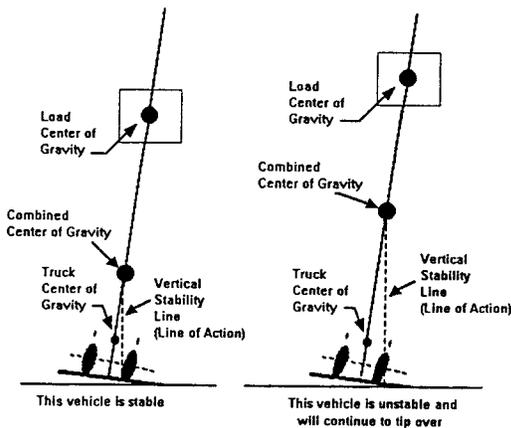


Figure 2

**(5) Longitudinal stability.**

(a) The axis of rotation when a truck tips forward is the front wheels' points of contact with the pavement. When a powered industrial truck tips forward, the truck will rotate about this line. When a truck is stable, the vehicle-moment must exceed the load-moment. As long as the vehicle-moment is equal to or exceeds the load-moment, the vehicle will not tip over. On the other hand, if the load-moment slightly exceeds the vehicle-moment, the truck will begin to tip forward, thereby causing the rear to lose contact with the floor or ground and resulting in loss of steering control. If the load-moment greatly exceeds the vehicle-moment, the truck will tip forward.

(b) To determine the maximum safe load-moment, the truck manufacturer normally rates the truck at a maximum load at a given distance from the front face of the forks. The specified distance from the front face of the forks to the line of action of the load is commonly called the load center. Because larger trucks normally handle loads that are physically larger, these vehicles have greater load centers. Trucks with a capacity of 30,000 pounds or less are normally rated at a given load weight at a 24-inch load center. Trucks with a capacity greater than 30,000 pounds are normally rated at a given load weight at a 36- or 48-inch load center. To safely operate the vehicle, the operator should always check the data plate to determine the maximum allowable weight at the rated load center.

(c) Although the true load-moment distance is measured from the front wheels, this distance is greater than the distance from the front face of the forks. Calculating the maximum allowable load-moment using the load-center distance always provides a lower load-moment than the truck was designed to handle. When handling unusual loads, such as those that are larger than 48 inches long (the center of gravity is greater than 24 inches) or that have an offset center of gravity, etc., a maximum allowable load-moment should be calculated and used to determine whether a load can be safely handled. For example, if an operator is operating a 3,000-pound capacity truck (with a 24-inch load center), the maximum allowable load-moment is 72,000 inch-pounds (3,000 times 24). If a load is 60 inches long (30-inch load center), then the maximum that this load can weigh is 2,400 pounds (72,000 divided by 30).

**(6) Lateral stability.**

(a) The vehicle's lateral stability is determined by the line of action's position (a vertical line that passes through the combined vehicle's and load's center of gravity) relative to the stability triangle. When the vehicle is not loaded, the truck's center of gravity location is the only factor to be considered in determining the truck's stability. As long as the line of action of the combined vehicle's and load's center of gravity falls within the stability triangle, the truck is stable and will not tip over. However, if the line of action falls outside the stability triangle, the truck is not stable and may tip over. Refer to Figure 3.

(b) Factors that affect the vehicle's lateral stability include the load's placement on the truck, the height of the load above the surface on which the vehicle is operating, and the vehicle's degree of lean.

**(7) Dynamic stability.**

(a) Up to this point, the stability of a powered industrial truck has been discussed without considering the dynamic forces that result when the vehicle and load are put into motion. The weight's transfer and the resultant shift in the center of gravity due to the dynamic forces created when the machine is moving, braking, cornering, lifting, tilting, and lowering loads, etc., are important stability considerations.

(b) When determining whether a load can be safely handled, the operator should exercise extra caution when handling loads that cause the vehicle to approach its maximum design characteristics. For example, if an operator must handle a maximum load, the load should be carried at the lowest position possible, the truck should be accelerated slowly and evenly, and the forks should be tilted forward cautiously. However, no precise rules can be formulated to cover all of these eventualities.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52030, filed 12/21/99, effective 3/1/00.]

**WAC 296-307-52031 What requirements apply to operating powered industrial trucks?** (1) No operator may drive a truck up to anyone standing in front of a fixed object.

(2) No one may stand or pass under the elevated portion of any truck, whether loaded or empty.

(3) Employers must not allow people to ride on powered industrial trucks unless a safe place to ride is provided.

(4) Employers must prohibit employees from placing any body parts between the uprights of the mast or outside the running lines of the truck.

(5) When an operator leaves a powered industrial truck unattended:

(a) The load must be fully lowered;

(b) The controls must be neutralized;

(c) The power must be shut off; and

(d) The brakes must be set.

(e) If the truck is parked on an incline, the wheels must be blocked.

A powered industrial truck is "unattended" when the operator is 25 feet or more away from the vehicle, which remains in view, or whenever the operator leaves the vehicle and it is not in view.

(6) When a truck operator is dismounted, within 25 feet of the truck, and still in view, the load must be fully lowered, the controls must be neutralized, and the brakes must be set to prevent movement.

(7) The operator must maintain a safe distance from the edge of ramps or platforms while operating on any elevated dock, or platform or freight car.

(8) There must be enough headroom for trucks to operate under overhead installations, lights, pipes, sprinkler systems, or other overhead projections.

(9) An active operator protection restraint device (such as a seatbelt or lap-bar) or system must be used, when provided.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52031, filed 12/21/99, effective 3/1/00. 97-09-013, recodified as § 296-307-52031, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52031, filed 10/31/96, effective 12/1/96.]

(2007 Ed.)

**WAC 296-307-52033 When may trucks be used to open or close freight car doors?** Trucks may only be used for opening or closing freight car doors with an approved device that meets the following requirements:

(1) The door opening or closing device requires that the force applied by the device to the door is parallel to the door travel.

(2) The truck operator is trained in the use of the door opening or closing device and keeps the operation in full view while opening and closing.

(3) The area is clear of people while the door is moved with a device.

[97-09-013, recodified as § 296-307-52033, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52033, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52035 What requirements apply to lifting employees on the forks of trucks?** Employees may be lifted on the lifting carriage or forks of a powered industrial truck under the following conditions:

(1) The truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks.

(2) A safety platform is firmly secured to the lifting carriage and/or forks.

(3) Employees on the platform have a mechanism to shut off power to the truck.

(4) Employees on the platform are protected from falling objects according to the operating conditions.

[97-09-013, recodified as § 296-307-52035, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52035, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52037 What requirements apply to using platforms for hoisting employees?** A platform built specifically for hoisting people may be used to lift employees when:

(1) The platform is securely attached to the forks and has standard guardrails and toeboards installed on all sides.

(2) The hydraulic system is designed so that the lift mechanism will not drop faster than 135 feet per minute in the event of a failure in any part of the system. Forklifts used for elevating work platforms are identified as meeting this requirement.

(3) A safety strap is installed or the control lever is locked to prevent the boom from tilting.

(4) An operator attends the lift equipment while employees are on the platform.

(5) The operator is in the normal operating position while raising or lowering the platform.

(6) The vehicle remains stationary while employees are on the platform.

Exception: Inching or maneuvering at very slow speed is permissible.

(7) The area between employees on the platform and the mast is adequately guarded to prevent contact with chains or other shear points.

[97-09-013, recodified as § 296-307-52037, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52037, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52039 What requirements apply to traveling in a powered industrial truck?** (1) The operator must maintain a safe distance of approximately three truck lengths from the truck ahead. The truck must be kept under control at all times.

(2) The operator must yield the right of way to ambulances, fire trucks, or other vehicles in emergency situations.

(3) Passing other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations is prohibited.

(4) Railroad tracks must be crossed diagonally wherever possible. The operator must not park closer than 8 feet from the center of railroad tracks.

(5) The operator must look in the direction of, and keep a clear view of, the path of travel.

(6) Stunt driving and horseplay are prohibited.

(7) The operator must approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, the operator must neutralize controls, shut off power, and set the brakes.

(8) Motorized hand trucks must enter elevator or other confined areas with load end forward.

(9) The operator must avoid running over loose objects on the roadway surface.

(10) Access to fire aisles, stairways, and fire equipment must be kept clear.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52039, filed 12/21/99, effective 3/1/00. 97-09-013, recodified as § 296-307-52039, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52039, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52041 What requirements apply to traveling speeds of powered industrial trucks?** (1) The operator must observe all traffic regulations, including authorized plant speed limits.

(2) The operator must slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load obstructs a forward view, the driver must travel with the load trailing.

Exception: If traveling with the load trailing creates new hazards, it is not required.

(3) The operator must ascend and descend grades slowly.

(a) At grades over 10 percent, loaded trucks must be driven with the load upgrade.

(b) Unloaded trucks should be operated on all grades with the load carrier downgrade.

(c) On all grades the load and load carrier must be tilted back if applicable, and raised only as far as necessary to clear the road surface.

(4) Under all travel conditions, the truck must be operated at a speed that will permit it to be stopped safely.

(5) The driver must slow down for wet and slippery floors.

(6) While negotiating turns, the operator must slow to a safe speed and turn the wheel in a smooth, sweeping motion.

[97-09-013, recodified as § 296-307-52041, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52041, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52043 What requirements apply to loading powered industrial trucks?** (1) All loads must be stable or safely arranged. Exercise caution when handling off-center loads that cannot be centered.

(2) All loads must be within the rated capacity of the truck.

(3) Take care securing, manipulating, positioning, and transporting loads when attachments are used. Trucks with attachments must be operated as partially loaded trucks when not handling a load.

(4) Place the load carrier under the load as far as possible. Tilt the mast backward to stabilize the load.

(5) Use extreme care when tilting the load forward or backward, particularly when high tiering. Avoid tilting the load forward with the load carrier elevated except to pick up a load, or when the load is in a deposit position over a rack or stack. When stacking or tiering, use only enough backward tilt to stabilize the load.

[97-09-013, recodified as § 296-307-52043, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52043, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52045 What requirements apply to servicing powered industrial trucks?** (1) Powered industrial trucks that need repairs, are defective, or in any way unsafe must be taken out of service until restored to safe operating condition.

(2) Stop the engine before filling fuel tanks. Avoid spilling fuel.

(3) When oil or fuel spills, wash the spill away carefully or evaporate the spill completely and replace the fuel tank cap before restarting engine.

(4) No truck may be operated with a leak in the fuel system.

(5) Open flames are prohibited for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

[97-09-013, recodified as § 296-307-52045, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52045, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-52047 What requirements apply to maintaining powered industrial trucks?** (1) Powered industrial trucks must be removed from service when not in safe operating condition. All repairs must be made by an authorized employee.

(2) No repairs may be made in Class I, II, and III locations.

(3) When repairs to fuel and ignition systems of industrial trucks involve fire hazards, the repairs must be conducted only in designated locations.

(4) Trucks in need of repairs to the electrical system must have the battery disconnected prior to repair.

(5) Industrial truck parts must be replaced only by parts of equivalent safety.

(6) Industrial trucks must not be altered so that the relative positions of parts are different from when they were manufactured. Industrial trucks must not have parts added or eliminated, except as provided in WAC 296-307-52005. Fork trucks must not have additional counterweighting added unless approved by the truck manufacturer.

(7) Industrial trucks must be examined at least daily before being placed in service. Industrial trucks must not be placed in service if the examination shows any unsafe condition.

Where industrial trucks are used on a round-the-clock basis, they shall be examined after each shift. Defects must be immediately reported and corrected.

(8) Water mufflers must be filled daily or as frequently as necessary to prevent the water supply from dropping below 75 percent. Vehicles must not be operated if muffler screens or other parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system must immediately be removed from service until the emission of such sparks and flames has been eliminated.

(9) When the temperature of any part of any truck exceeds its normal operating temperature, the vehicle must be removed from service until the cause for overheating has been eliminated.

(10) Industrial trucks must be kept clean and free of excess accumulations of combustible materials, oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100°F) solvents must not be used. High flash point (at or above 100°F) solvents may be used. Take precautions regarding toxicity, ventilation, and fire hazard according to the agent or solvent used.

(11) Industrial trucks originally approved to use gasoline fuel may be converted to use LP-gas fuel if the converted truck has the features specified for LP or LPS designated trucks. The converted equipment must be approved. You may find a description of the conversion system and the recommended method of installation in the "listed by report" of a nationally recognized testing laboratory.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 00-01-176, § 296-307-52047, filed 12/21/99, effective 3/1/00. Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52047, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-52047, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-52047, filed 10/31/96, effective 12/1/96.]

## Part X Rim Wheel Servicing

### WAC 296-307-530 Rim wheel servicing.

[97-09-013, recodified as § 296-307-530, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-530, filed 10/31/96, effective 12/1/96.]

### WAC 296-307-53001 What does this section cover?

WAC 296-307-530 applies to the servicing of multipiece and single-piece rim wheels used on large vehicles such as trucks, tractors, trailers, buses and off-road machines. It does not apply to servicing rim wheels used on automobiles, or on pickup trucks and vans with automobile tires or truck tires designated "LT."

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-53001, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-53001, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-22-048, § 296-306A-53001, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53003 What definitions apply to rim wheel servicing?** "Barrier" means a fence, wall, or structure

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placed between a single-piece rim wheel and an employee during tire inflation, to contain the rim wheel components in the event of the sudden release of the contained air of the single-piece rim wheel.

"Charts" means the United States Department of Labor, Occupational Safety and Health Administration (OSHA) publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Matching Chart," the National Highway Traffic Safety Administration (NHTSA) publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Matching Chart," or any other poster that contains at least the same instructions, safety precautions and other information contained in the charts that is applicable to the types of wheels being serviced.

"Installing a rim wheel" means the transfer and attachment of an assembled rim wheel onto a vehicle axle hub. "Removing" means the opposite of installing.

"Mounting a tire" means the assembly or putting together of the wheel and tire components to form a rim wheel, including inflation. "Demounting" means the opposite of mounting.

"Multipiece rim wheel" means the assembly of a multipiece wheel with the tire tube and other components.

"Multipiece wheel" means a vehicle wheel consisting of two or more parts, one of which is a side or locking ring designed to hold the tire on the wheel by interlocking components, when the tire is inflated.

"Restraining device" means a cage, rack, assembly of bars, or other components that will constrain all rim wheel components during an explosive separation of a multipiece rim wheel, or during the sudden release of the contained air of a single-piece rim wheel.

"Rim manual" means a publication containing instructions from the manufacturer or other qualified organization for correct mounting, demounting, maintenance, and safety precautions peculiar to the type of wheel being serviced.

"Rim wheel" means an assembly of tire, tube and liner (where appropriate), and wheel components.

"Service" or "servicing" means the mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing, removing, and handling.

"Service area" means that part of an employer's premises used for the servicing of rim wheels, or any other place where an employee services rim wheels.

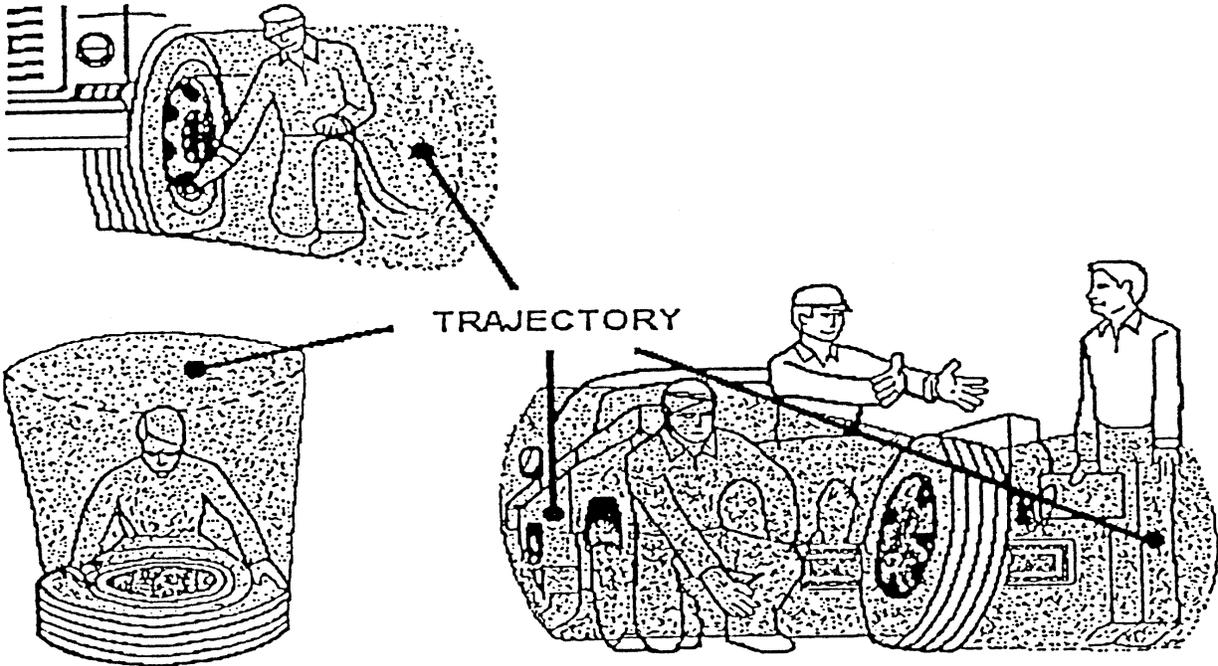
"Single-piece rim wheel" means the assembly of single-piece rim wheel with the tire and other components.

"Single-piece wheel" means a vehicle wheel consisting of one part, designed to hold the tire on the wheel when the tire is inflated.

"Trajectory" means:

- Any potential path that a rim wheel component may travel during an explosive separation, or the sudden release of the pressurized air; or
- An area at which an air blast from a single-piece rim wheel may be released.

The trajectory may deviate from paths that are perpendicular to the assembled position of the rim wheel. (See Figure for examples of trajectories.)



"Wheel" means the part of a rim wheel that provides the method of attachment of the assembly to the axle of a vehicle and also provides the means to contain the inflated portion of the assembly (i.e., the tire and/or tube).

[97-09-013, recodified as § 296-307-53003, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53003, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53005 What training must an employer provide for employees who service rim wheels?**

(1) You must implement a training program that covers at least the following:

- (a) The hazards involved in servicing rim wheels;
- (b) The safe operating procedures for the types of wheel serviced, described in WAC 296-307-53013 and 296-307-53015; and
- (c) The applicable data contained in the charts (rim manuals) and the contents of this standard.

(2) You must ensure that each employee demonstrates and maintains the ability to service rim wheels safely, including the following:

- (a) Demounting tires (including deflation);
- (b) Inspecting and identifying the rim wheel components;
- (c) Mounting tires (including inflation with a restraining device or other safeguard required by this section);
- (d) Using the restraining device and other equipment required by this section;
- (e) Handling rim wheels;
- (f) Inflating the tire when a single-piece rim wheel is mounted on a vehicle;
- (g) Understanding the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation; and
- (h) Installing and removing rim wheels.

(3) If you believe that any employee is unable to read and understand the charts or rim manual, you must instruct the

employee in the contents of the charts and rim manual in a manner that the employee can understand.

(4) You must evaluate each employee's ability to perform these tasks safely, and provide additional training as necessary to ensure that each employee maintains proficiency.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-53005, filed 12/1/98, effective 3/1/99. 97-09-013, recodified as § 296-307-53005, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53005, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53007 What requirements apply to restraining devices?** (1) You must furnish a restraining device for inflating tires on multipiece wheels.

(2) You must provide a restraining device for inflating tires on single-piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

(3) Restraining devices must:

- (a) Withstand the force of a rim wheel separation occurring at 150% of the maximum tire pressure for the rim wheel being serviced.
- (b) Prevent the rim wheel components from being thrown out of the device.
- (c) The restraining device is visually inspected before each day's use and after any rim wheel separation or sudden release of contained air. Any damaged restraining device is immediately removed from service.

(d) If the restraining device is removed from service, it is not returned to service until repaired and reinspected. If the restraining device requires structural repair, it is not returned to service until certified by either the manufacturer or a registered professional engineer to meet the strength requirements of (a) of this subsection.

[97-09-013, recodified as § 296-307-53009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53007, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53009 What other equipment must an employer provide for rim wheel servicing?** (1) You must furnish an air line assembly and ensure that employees use it for inflating tire.

(2) The air line assembly must contain the following components:

- (a) A clip-on chuck;
- (b) An in-line valve with a pressure gauge or a presettable regulator; and
- (c) Enough hose between the clip-on chuck and the in-line valve (if one is used) to allow the employee to stand outside the trajectory.

(3) Current charts or rim manuals for the types of wheels being serviced shall be available in the service area.

(4) You must furnish the tools recommended in the rim manual for the type of wheel being serviced and ensure that they are the only tools used to service rim wheels.

[97-09-013, recodified as § 296-307-53009, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53009, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53011 What requirements apply to wheel component assembly?** (1) You must ensure that multipiece wheel components are not interchanged except as provided in the charts or rim manual.

(2) Multipiece wheel components and single-piece wheels must be inspected prior to assembly. Any wheel or wheel component that is bent out of shape, pitted from corrosion, broken, or cracked shall not be used. Mark damaged wheels or components "unserviceable" and remove from the service area. Replace damaged or leaky valves.

(3) Rim flanges, rim gutters, rings, bead seating surfaces and the bead areas of tires must be free of any dirt, surface rust, scale or loose or flaked rubber build-up prior to mounting and inflation.

(4) The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel must be checked for compatibility before assembly.

[97-09-013, recodified as § 296-307-53011, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53011, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53013 What are the safe operating procedures for servicing multipiece rim wheels?** You must establish safe operating procedures for servicing multipiece rim wheels, and ensure that employees are instructed in and follow the procedures. Your procedures must include at least the following:

(1) Before demounting, remove the valve core to completely deflate the tire.

(2) Remove the valve core to completely deflate the tire before removing a rim wheel from the axle whenever:

- (a) The tire has been driven on underinflated at eighty percent or less of its recommended pressure; or
- (b) There is obvious or suspected damage to the tire or wheel components.

(3) Apply rubber lubricant to bead and rim mating surfaces during wheel assembly and tire inflation, unless the tire or wheel manufacturer recommends against it.

(4) A tire on a vehicle underinflated at more than eighty percent of the recommended pressure may be inflated while

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the rim wheel is on the vehicle, only if remote control inflation equipment is used and no employees remain in the trajectory during inflation.

(5) Tires may be inflated outside a restraining device only to pressure sufficient to force the tire bead onto the rim ledge and to create an airtight seal with the tire and bead.

(6) Whenever a rim wheel is in a restraining device, the employee must not rest any part of the body or equipment on the restraining device.

(7) After tire inflation, inspect the tire and wheel components while still within the restraining device. Ensure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, deflate the tire by removing the valve core before making adjustments.

(8) Never correct the seating of side and lock rings by hammering, striking, or forcing the components while the tire is pressurized.

(9) Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.

(10) When handling multipiece rim wheels, employees must stay out of the trajectory unless the performance of the servicing makes the employee's presence in the trajectory necessary.

(11) Do not apply heat to a multipiece wheel or wheel component.

[97-09-013, recodified as § 296-307-53013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53013, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53015 What are the safe operating procedures for servicing single-piece rim wheels?** You must establish safe operating procedures for servicing single-piece rim wheels, and ensure that employees are instructed in and follow the procedures. Your procedures must include at least the following:

(1) Before demounting, remove the valve core to completely deflate the tire.

(2) Mount and demount tires only from the narrow ledge side of the wheel. Take care to avoid damaging the tire beads while mounting. Only mount tires on compatible wheels of matching bead diameter and width.

(3) Apply nonflammable rubber lubricant to bead and wheel mating surfaces before rim wheel assembly, unless the tire or wheel manufacturer recommends against it.

(4) When using a tire changing machine, inflate tires only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.

(5) When using a bead expander, remove the bead expander before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).

(6) Always inflate tires within a restraining device, positioned behind a barrier, or bolted on the vehicle with the lug nuts fully tightened.

(7) Inflate tires only when the trajectory area is clear of flat, solid objects.

(8) Employees stay out of the trajectory when inflating a tire.

(9) Tires must not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.

(10) Tires must not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

(11) Heat must not be applied to a single-piece wheel.

(12) Cracked, broken, bent, or otherwise damaged wheels must not be reworked, welded, brazed, or otherwise heated.

[97-09-013, recodified as § 296-307-53015, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53015, filed 10/31/96, effective 12/1/96.]

**WAC 296-307-53017 How can an employer order the OSHA charts?** OSHA charts are available through OSHA area offices. You may find the address and telephone number of the nearest OSHA office in the local telephone directory under U.S. Government, U.S. Department of Labor, Occupational Safety and Health Administration. Single copies are available without charge.

If you want multiple copies of these charts, you may order them from the Publications Office, U.S. Department of Labor, Room N3101, Washington, D.C. 20210. Telephone: (202) 523-9667.

[97-09-013, recodified as § 296-307-53017, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53017, filed 10/31/96, effective 12/1/96.]

**Part Y  
Occupational Health Standards**

**Part Y-1  
Employer Chemical Hazard Communication**

**WAC 296-307-550 Employer chemical hazard communication—Introduction.** Important:

Thousands of chemicals can be found in today's workplaces. These chemicals may have the capacity to cause health problems, from minor skin irritations to serious injuries or diseases like cancer.

The employer chemical hazard communication rule was developed to make sure employers and employees are informed about chemical hazards in the workplace.

This rule applies to:

- Employers engaged in businesses where chemicals are used, distributed, or produced for use or distribution.
- Contractors or subcontractors that work for employers engaged in businesses where chemicals are used, distributed, or produced for use or distribution.

Note:

- If you produce, import, distribute and/or repackage chemicals, or choose not to rely on labels or material safety data sheets provided by the manufacturer or importer, you must comply with Material safety data sheets and label preparation, WAC 296-307-560 through 296-307-56050.
- You may withhold trade secret information under certain circumstances, see Trade secrets, WAC 296-62-053, to find out what information may be withheld as a trade secret and what information must be released.

EXEMPTIONS:

- For the purposes of this employer hazard communication rule, if you are engaged in agricultural production of crops or livestock, "employee" does not mean:

- Immediate family members of the officers of any corporation, partnership, sole proprietorship or other business entity or officers of any closely held corporation.
  - Certain products, chemicals, or items are exempt from this rule. Below is a summarized list of these exemptions. See WAC 296-307-55055 at the end of this rule to get complete information about these exemptions:
    - Any hazardous waste or substance
    - Tobacco or tobacco products
    - Wood or wood products that are not chemically treated and will not be processed, for example, by sawing and sanding
    - Food or alcoholic beverages
    - Some drugs, such as retail or prescription medications
    - Retail cosmetics
    - Ionizing and nonionizing radiation
    - Biological hazards
    - Any consumer product or hazardous substance when workplace exposure is the same as that of a consumer
    - ◆ Retail products used in offices in the same manner and frequency used by consumers can be termed "consumer products." Consumer products include things such as: Correction fluid, glass cleaner, and dishwashing liquid.
- Example: If you use a household cleaner in your workplace in the same way that a consumer would use it when cleaning their house, the exposure should be the same as the consumer's. ("In the same way" means using the household cleaner in the same manner and frequency.) A janitor using a household cleaner, such as bleach, throughout the day, is not considered to be consumer use.
- Manufactured items that remain intact are exempt for this rule.
- The following are examples:

Item	Covered by this rule	Not covered by this rule
Brick	sawed or cut in half	used whole or intact
Pipe	cut by a torch	bent with a tube bender
Nylon rope	burning the ends	tying a knot

- Manufactured items that are fluids or in the form of particles are not exempt for this rule.

**Your responsibility:**

To inform and train your employees about the hazards of chemicals they may be exposed to during normal working conditions, or in foreseeable emergencies by:

- Making a list of the hazardous chemicals present in your workplace
- Preparing a written Chemical Hazard Communication Program for your workplace
- Informing your employees about this rule and your program
- Providing training to your employees about working in the presence of hazardous chemicals
- Getting and keeping the material safety data sheets (MSDSs) for the hazardous chemicals
- Making sure that labels on containers of hazardous chemicals are in place and easy to read

**You must:**

Develop, implement, maintain, and make available a written Chemical Hazard Communication Program

WAC 296-307-55005

Identify and list all the hazardous chemicals present in your workplace

WAC 296-307-55010

Obtain and maintain material safety data sheets (MSDSs) for each hazardous chemical used

WAC 296-307-55015

Make sure that material safety data sheets (MSDSs) are readily accessible to your employees

WAC 296-307-55020

Label containers holding hazardous chemicals

WAC 296-307-55025

Inform and train your employees about hazardous chemicals in your workplace

*WAC 296-307-55030*

Follow these rules for laboratories using hazardous chemicals

*WAC 296-307-55035*

Follow these rules for handling chemicals in factory sealed containers

*WAC 296-307-55040*

**The department must:**

Translate certain chemical hazard communication documents upon request

*WAC 296-307-55045*

Attempt to obtain a material safety data sheet (MSDS) upon request

*WAC 296-307-55050*

Exemption: Items or chemicals exempt from the rule, and exemptions from labeling

*WAC 296-307-55055*

Definitions

*WAC 296-307-55060*

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-550, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-550, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55005 Develop, implement, maintain, and make available a written Chemical Hazard Communication Program. You must:**

- Develop, implement, maintain, and make available a written Chemical Hazard Communication Program specifically for your workplace. The Chemical Hazard Communication Program must, at a minimum, include:

- A list of hazardous chemicals known to be present in your workplace

- Procedures for making sure all containers are properly labeled

- A description of how you are going to obtain and maintain your material safety data sheets (MSDSs)

- A description of how you are going to train and inform your employees about hazardous chemicals in their workplace

- A description of how you are going to inform your employees about:

- ◆ Chemical hazards used during nonroutine tasks

- ◆ The hazards associated with chemicals contained in unlabeled pipes in their work areas

**You must:**

- Make sure your written Chemical Hazard Communication Program includes the following communication methods you will apply if you produce, use, or store hazardous chemicals at your workplace(s) in such a way that the employees of other employer(s) may be exposed:

- Provide the other employer(s) with a copy of the relevant material safety data sheets (MSDSs), or provide access to the MSDSs in a central location at the workplace

- Inform the other employer(s) of any precautionary measures that need to be taken to protect employees during normal operating conditions and in foreseeable emergencies

- Describe how to inform the other employer(s) of the labeling system used in the workplace

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Note:

- Examples of employees of other employers who could be exposed to chemical hazards that you produce, use, or store in your workplace include employees of construction companies, cleaning services, or maintenance contractors visiting or working on-site.
- Your employees have the right to get chemical hazard communication information from other employers at workplaces where they are working; and employees of other employers have the right to get the information from you when they are working at your workplace.
- Include in your written Chemical Hazard Communication Program the methods that you will use to share information with other employers and their employees at your workplace(s) regarding:
  - Access to MSDSs
  - Precautionary measures such as personal protective equipment (PPE) and emergency plans
  - Any labeling systems used at the workplace.
 If you rely on another employer's chemical hazard communication program to share the information required and the program meets the requirements of this rule, document in your own written Chemical Hazard Communication Program.

**You must:**

- Make your Chemical Hazard Communication Program available to your employees.

Note:

Where employees must travel between workplaces during a workshift, that is, if their work is carried out at more than one geographical location, the written Chemical Hazard Communication Program may be kept at the primary workplace facility.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-55005, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55010 Identify and list all the hazardous chemicals present in your workplace. You must:**

- Identify all hazardous chemicals in your workplace. This includes any chemical that is known to be present in your workplace in such a way that employees may be exposed to it under normal conditions of use or in a foreseeable emergency.

- Create a list of these chemicals using the chemical or common name on the material safety data sheet (MSDS). This list:

- Must be compiled for the workplace as a whole, or for individual work areas.

- Is necessary to make sure that all hazardous chemicals are identified and that MSDS, and labeling rules are met.

- Must be current.

Note:

The following are some ways to determine whether a product is hazardous:

- Look for words on the label, such as "CAUTION," "WARNING," or "DANGER."
- Look for words or "hazard coding" that indicate that the chemical is flammable, an irritant, corrosive, carcinogenic, etc. "Hazard coding" refers to words, numbers, or colors that tell you a chemical is dangerous.
- Check the product's MSDS for hazard information. Examples of hazardous chemicals are: Acids, adhesives, caustics, fuels, paints, varnishes, shellacs and pesticides. Too many other classes of hazardous chemicals exist to list them all here. If you have any questions about a chemical you have at your workplace, contact your local L&I office.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-55010, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55015 Obtain and maintain material safety data sheets (MSDSs) for each hazardous chemical used.**

**You must:**

- Obtain a MSDS for each hazardous chemical used as soon as possible if the MSDS is not provided with the shipment of a hazardous chemical from the chemical manufacturer or importer.

## Note:

- To obtain a MSDS, you may try calling the manufacturer or checking their web site.
- If you have a commercial account with a retailer or wholesaler, you have the right to request and receive a MSDS about hazardous chemicals you purchase.
- If a chemical is purchased from a retailer with no commercial accounts, you have the right to request and receive the manufacturer's name and address so that you can contact them and request a MSDS for the chemical.
- Whoever prepares the MSDS is required to mark all blocks on the form, even if there is no relevant information for that section.
- If you have problems getting a MSDS within 30 calendar days after making a written request to the chemical manufacturer, importer, or distributor, you can get help from WISHA. You may contact your local regional office for assistance or make a written request for assistance to the:
 

Department of Labor and Industries  
Right-to-Know Program  
P.O. Box 44610  
Olympia, Washington 98504-4610
- Include in your request:
  - A copy of the purchaser's written request to the chemical manufacturer, importer, or distributor
  - The name of the product suspected of containing a hazardous chemical
  - The identification number of the product, if available
  - A copy of the product label, if available
  - The name and address of the chemical manufacturer, importer, or distributor from whom the product was obtained

**You must:**

- Maintain a MSDS for each hazardous chemical:
  - Keep copies of the required MSDSs for each hazardous chemical present in your workplace. These may be kept in any form, including as a part of operating procedures.
  - Each MSDS must be in English. You may also keep copies in other languages.

## Note:

- If you choose not to rely on MSDSs or labels provided by the manufacturer or importer, you must comply with the chemical hazard communication standard for manufacturers, importers, and distributors, WAC 296-307-560 through 296-307-56050.
- It may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. MSDSs can be designed to cover groups of hazardous chemicals in a work area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-55015, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-370-55015, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55020 Make sure material safety data sheets are readily accessible to your employees. You must:**

- Make sure that MSDSs are readily accessible, easily obtained without delay during each work shift to employees when they are in their work area(s).
- Make sure that employees, who must travel between workplaces during a work shift, such as when their work is carried out at more than one geographical location, can immediately obtain the required MSDS information in an emergency. (MSDSs may be kept at a central location at the primary workplace facility and accessed by means such as voice communication or laptop computer.)

[Title 296 WAC—p. 2562]

## Note:

- Electronic access (such as computer or fax), microfiche, and other alternatives to maintaining paper copies of the MSDSs are permitted as long as they do not create barriers to immediate employee access in each workplace.
- Barriers to immediate access of electronic MSDSs may include:
  - Power outages
  - Equipment failure
  - System delays
  - Deficient user knowledge to operate equipment
  - Location of equipment outside the work area
 Solutions to eliminating these and other possible barriers to access may require the availability of back-up systems, employee training, and providing access equipment in the work areas.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-55020, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55025 Label containers holding hazardous chemicals.**

## EXEMPTIONS:

The following is a summary of items that are exempt from this rule. For complete information about each of these, see WAC 296-307-55055.

- Pesticides, when labeled as required by the Environmental Protection Agency (EPA)
- Food, food additives, color additives, drugs, cosmetics, or medical/veterinary devices or products
- Alcoholic beverages not intended for industrial use
- Consumer products labeled, as required, by the Consumer Product Safety Commission
- Agriculture or vegetable seeds treated and labeled as required by the Federal Seed Act

Note: You are not required to label portable containers into which hazardous chemicals are transferred from labeled containers, if the chemical is used and controlled by the employee who performed the transfer within the same shift.

**You must:**

- Make sure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked with the following information:
  - The identity of the hazardous chemical(s) using either the chemical or common name

Note: You are not required to list each component in a hazardous mixture on the label. If a mixture is referred to on a material safety data sheet (MSDS) by a product name, then the product name should be used as the identifier.

- Appropriate hazard warnings which give general information about the relevant health and physical hazards of the chemicals. This includes health effects information, such as information about organs most likely to be affected by the chemicals.

## EXAMPLES OF LABEL:

Name of Chemical Physical Hazards Health Hazards; • Health effects information • Affected Target Organs
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- For individual stationary process containers, you may use alternate labeling methods such as:

- ◆ Signs
- ◆ Placards
- ◆ Process sheets
- ◆ Batch tickets
- ◆ Operating procedures or

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◆ Other such written materials, as long as the alternate method identifies the containers and conveys the required label information.

Note:

- You may use words, pictures, symbols or any combination to communicate the hazards of the chemical. Be sure to train your employees so they can demonstrate a knowledge of the labeling system you use.



- Some alternative labeling systems do not communicate target organ information, so the employee will have to rely on training provided by the employer to obtain this information.

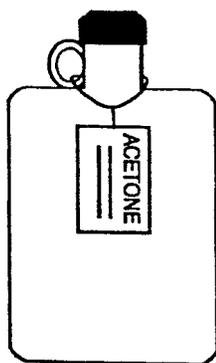
**You must:**

- Not remove or deface existing labels on incoming containers of hazardous chemicals (such as those marked with United States Department of Transportation (USDOT) markings, placards, and labels), unless the container is immediately labeled with the required information. You do not need to put on new labels if existing labels already provide the required information. If the package or container is sufficiently cleaned of residue and purged of vapors to remove any potential health or physical hazard, existing labels can be removed.

- Make sure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift.

Note:

- Employers with non-English speaking employees may use other languages in the warning information in addition to the English language.



- Above is an example of a labeled container. You may use a laminated or coated label, affixed to the container with a wire, to avoid deterioration of labels due to a solvent, such as acetone.

**You must:**

- Make sure if the hazardous chemical is regulated by WISHA or OSHA in a substance-specific health rule, that the labels or other warnings are used according to those rules.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-55025, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55030 Inform and train your employees about hazardous chemicals in your workplace.**

**Note:** The employer chemical hazard communication information and training requirements also apply to pesticides. Employers who have employees who are exposed to pesticides must be in compliance with this rule and the worker protection standards, WAC 296-307-12040.

**You must:**

- Provide employees with effective information on hazardous chemicals in their work area at the time of their initial job assignment. Whenever a new physical or health hazard related to chemical exposure is introduced into their employees' work areas, information must be provided.

– Inform employees of:

- ◆ The requirements of this rule.
- ◆ Any operations in their work area where hazardous chemicals are present.

- ◆ The location and availability of your written Chemical Hazard Communication Program, including the list(s) of hazardous chemicals and material safety data sheets (MSDSs) required by this rule.

- Provide employees with effective training about hazardous chemicals in their work area at the time of their initial job assignment. Whenever a new physical or health hazard related to chemical exposure is introduced, the employees must be trained.

- Make sure that employee training includes:

– Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area. Examples of these methods and observations may include:

- ◆ Monitoring conducted by you
- ◆ Continuous monitoring devices
- ◆ Visual appearance or odor of hazardous chemicals when being released

– Physical and health hazards of the chemicals in the work area, including the likely physical symptoms or effects of overexposure

– Steps employees can take to protect themselves from the chemical hazards in your workplace, including specific procedures implemented by you to protect employees from exposure to hazardous chemicals. Specific procedures may include:

- Appropriate work practices
- Engineering controls
- Emergency procedures
- Personal protective equipment to be used

– Details of the Chemical Hazard Communication Program developed by you, including an explanation of the labeling system and the MSDS, and how employees can obtain and use the appropriate hazard information.

- Tailor information and training to the types of hazards to which employees will be exposed. The information and training may be designed to cover categories of hazards, such as flammability or cancer-causing potential, or it may address specific chemicals. Chemical-specific information must always be available through labels and MSDSs.

- Make reasonable efforts to post notices in your employees' native languages (as provided by the department) if those employees have trouble communicating in English.

**Note:**

- Interactive computer-based training or training videos can be used provided they are effective.
- Your MSDSs may not have WISHA permissible exposure limits (PELs) listed. In some cases, WISHA PELs are stricter than the OSHA PELs and other exposure limits listed on the MSDSs you receive. If this is the case, you must refer to the WISHA PEL table, WAC 296-307-62625, for the appropriate exposure limits to be covered during training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-55030, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-55030, filed 5/6/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 01-17-033, § 296-307-55030, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55035 Follow these rules for laboratories using hazardous chemicals.**

**Note:** Laboratories are required to have a written chemical hygiene plan under chapter 296-828 WAC, Hazardous chemicals in laboratories, if applicable. They are not required to have a written Chemical Hazard Communication Program.  
You may combine your Accident Prevention Program and Chemical Hazard Communication Program to assist you in developing a Chemical Hygiene Plan for your laboratory.

**You must:**

(1) Make sure that labels on incoming containers of hazardous chemicals are in place and readable.

(2) Maintain material safety data sheets (MSDSs) received with incoming shipments of hazardous chemicals and make them available to laboratory employees when they are in their work areas.

(3) Provide laboratory employees with information and training as described in: "Inform and train your employees about hazardous chemicals in your workplace," WAC 296-307-55030, except for the part about the location and availability of the written Chemical Hazard Communication Program.

**Note:** Laboratory employers that ship hazardous chemicals are considered to be either chemical manufacturers or distributors. When laboratory employers ship hazardous chemicals they must comply with the rule, Material safety data sheets and label preparation, WAC 296-307-560 through 296-307-56050.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060, 06-02-060, § 296-307-55035, filed 1/3/06, effective 4/1/06; 05-01-166, § 296-307-55035, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 01-17-033, § 296-307-55035, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55040 Follow these rules for handling chemicals in factory-sealed containers. You must:**

This applies to situations where employees only handle chemicals in factory-sealed containers that are not opened under normal use (such as those found in marine cargo handling, trucking, warehousing, or retail sales).

**You must:**

(1) Make sure that labels on incoming containers of hazardous chemicals are in place and readable.

(2) Keep or obtain material safety data sheets.

- Keep any MSDSs that are received with incoming shipments of the sealed containers of hazardous chemicals

- If a factory-sealed container of hazardous chemicals comes without a MSDS, obtain one as soon as possible, if an employee requests it

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(3) Make sure that the MSDSs are readily accessible during each work shift to employees when they are in their work area(s).

(4) Inform and train your employees about hazardous chemicals in your workplace, to protect them in case of a hazardous chemical spill or leak from a factory-sealed container. You do not have to cover the location and availability of the written Chemical Hazard Communication Program.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 01-17-033, § 296-307-55040, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55045 Translate certain chemical hazard communication documents upon request. The department must:**

- Upon receipt of a written or verbal request, prepare and make available (within available resources) to employers or the public, a translation into Cambodian, Chinese, Korean, Spanish, or Vietnamese of any of the following:

- An employer's written Chemical Hazard Communication Program

- A material safety data sheet or

- Written materials prepared by the department to inform employees of their rights described in this rule, regarding chemical hazard communication

**Note:** Written requests for translations should be directed to:  
Department of Labor and Industries  
Right-to-Know Program  
P.O. Box 44610  
Olympia, Washington 98504-4610

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 01-17-033, § 296-307-55045, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55050 Attempt to obtain a material safety data sheet (MSDS) upon request. The department must:**

- Upon receipt of an employer's written request for a material safety data sheet, attempt to obtain the MSDS from the chemical manufacturer, importer, or distributor. When the department receives the MSDS, the department must forward a copy of it to the purchaser at no cost. Small business employers will be given priority for this service.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050, 01-17-033, § 296-307-55050, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-55055 Items or chemicals exempt from the rule, and exemptions from labeling.**

- Listed below are the full descriptions of the items or chemicals that are exempt, or not covered, by this rule:

- Any consumer product or hazardous substance, defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substance Act (15 U.S.C. 1261 et seq.) respectively, where you can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure that is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.

- Any hazardous waste, defined by the Hazardous Waste Management Act chapter 70.105 RCW, when subject to regulations issued under that act by the department of ecology, that describes specific safety, labeling, personnel training,

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and other rules for the accumulation, handling, and management of hazardous waste.

– Any hazardous waste, defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that act by the Environmental Protection Agency.

– Any hazardous substance, defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.), when the hazardous substance is the focus of remedial or removal action being conducted under CERCLA in accordance with Environmental Protection Agency regulations.

– Tobacco or tobacco products.

– Wood or wood products, including lumber that will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to the employees is the potential for flammability or combustibility. Wood or wood products that have been treated with hazardous chemicals covered by this rule, and wood that may be subsequently sawed or cut, generating dust, are not exempt.

– Articles, meaning manufactured items other than a fluid or particle that:

◆ Are formed to a specific shape or design during manufacture;

◆ Have end use function(s) dependent in whole or in part upon their shape or design during end use; and

◆ Under normal conditions of use, do not release more than very small quantities, for example minute or trace amounts of a hazardous chemical such as emissions from a marking pen or a newly varnished wood chair, and do not pose a physical hazard or health risk to employees.

– Food or alcoholic beverages that are sold, used, or prepared in a retail establishment such as a grocery store, restaurant, or drinking place, and foods intended for personal consumption by employees while in the workplace.

– Any drug, defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.), when it is in solid, final form for direct administration to the patient (for example, tablets or pills); drugs that are packaged by the chemical manufacturer for sale to consumers in a retail establishment (for example over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (for example, first-aid supplies). Aerosolized or cytotoxic drugs administered by a health care worker are not excluded.

– Cosmetics packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the *workplace*.

– Ionizing and nonionizing radiation.

– Biological hazards.

• This rule does not require labeling of the following chemicals:

– Any pesticide, defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that act and labeling regulations issued under that act by the Environmental Protection Agency.

– Any chemical substance or mixture, in the Toxic Substance Control Act (15 U.S.C. 2601 et seq.), when subject to the labeling requirements of that act, and labeling require-

ments issued under that act by the Environmental Protection Agency.

– Any food, food additive, color additive, drug, cosmetic, or medical/veterinary device or product, including materials intended for use as ingredients in such products (for example, flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or the Virus-Serum Toxin Act of 1913 (21 U.S.C. 151 et seq.) and regulations issued under those acts, when they are subject to the labeling requirements under those acts by either the Food and Drug Administration or the Department of Agriculture.

– Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that act, when subject to the labeling requirements of that act and labeling regulations issued under that act by the Bureau of Alcohol, Tobacco, and Firearms.

– Any consumer product or hazardous substance, as defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety rule or labeling requirement of those acts, or regulations issued under those acts by the Consumer Product Safety Commission.

– Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7 U.S.C. 1551 et seq.), and the labeling requirements issued under that act by the Department of Agriculture.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-55055, filed 8/8/01, effective 9/1/01.]

### WAC 296-307-55060 Definitions.

#### Chemical

• An element or mixture of elements

OR

• A compound or mixture of compounds

OR

• A mixture of elements and compounds

Included are manufactured items (such as bricks, weld- ing rods, and sheet metal) that are not exempt as an article.

#### Chemical manufacturer

An employer with a workplace where one or more chem- icals are produced for use or distribution.

#### Chemical name

• The scientific designation of a chemical developed by the:

– International Union of Pure and Applied Chemistry (IUPAC)

OR

– Chemical abstracts service (CAS) rules of nomencla- ture

OR

– A name that clearly identifies the chemical for the pur- pose of conducting a hazard evaluation.

#### Combustible liquid

Liquids with a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). A mixture with at least 99% of its components having flashpoints of 200°F (93.3°C), or higher, is not considered a combustible liquid.

**Commercial account**

An arrangement where a retailer is selling hazardous chemicals to an employer

- Generally in large quantities over time
- OR
- At costs below regular retail price.

**Common name**

Any designation or identification used to identify a chemical other than the chemical name, such as a:

- Code name or number
- OR
- Trade or brand name
- OR
- Generic name.

**Compressed gas**

A contained gas or mixture of gases with an absolute pressure greater than:

- 40 psi at 70°F (21.1°C)
- OR
- 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C)

OR

A liquid with a vapor pressure greater than 40 psi at 100°F (37.8°C) as determined by ASTM D323-72.

**Container**

A vessel, other than a pipe or piping system, that holds a hazardous chemical. Examples include:

- Bags
- Barrels
- Bottles
- Boxes
- Cans
- Cylinders
- Drums
- Rail cars
- Reaction vessels
- Storage tanks.

**Designated representative**

• An individual or organization with written authorization from an employee.

OR

• A recognized or certified collective bargaining agent (not necessarily authorized by an employee).

OR

• A legal representative of a deceased or legally incapacitated employee.

**Director**

The director means the director of the department of labor and industries or their designee.

**Distributor**

A business, other than a chemical manufacturer or importer, that supplies hazardous chemicals to other distributors or to employers. See WAC 296-307-560 through 296-307-56050 for requirements dealing with manufacturers, distributors and importers - hazard communication.

**Employee**

The term employee and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, means an employee of an employer who is employed in the business of his or her employer whether by way of manual labor or otherwise and every person in this

state who is engaged in the employment of or who is working under an independent contract the essence of which is personal labor for an employer under this standard whether by way of manual labor or otherwise.

**Employer**

An employer is any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: Provided, That any persons, partnership, or business entity not having employees, and who is covered by the Industrial Insurance Act must be considered both an employer and an employee.

**Explosive**

A chemical that causes a sudden, almost instant release of pressure, gas, and heat when exposed to a sudden shock, pressure, or high temperature.

**Exposure or exposed**

An employee has been, or may have possibly been, subjected to a hazardous chemical, toxic substance or harmful physical agent while working. An employee could have been exposed to hazardous chemicals, toxic substances, or harmful physical agents in any of the following ways:

- Inhalation
- Ingestion
- Skin contact
- Absorption
- Related means.

The terms exposure and exposed only cover workplace exposure involving a toxic substance or harmful physical agent in the workplace different from typical nonoccupational situations in the way it is:

- Used
  - Handled
  - Stored
  - Generated
- OR
- Present.

**Flammable**

A chemical in one of the following categories:

• Aerosols that, when tested using a method described in 16 CFR 1500.45, yield either a:

– Flame projection of more than eighteen inches at full valve opening

OR

– A flashback (a flame extending back to the valve) at any degree of valve opening

• Gases that, at the temperature and pressure of the surrounding area, form a:

– Flammable mixture with air at a concentration of thirteen percent, by volume, or less

OR

– Range of flammable mixtures with air wider than twelve percent, by volume, regardless of the lower limit

• Liquids with a flashpoint below 100°F (37.8°C). A mixture with at least ninety-nine percent of its components

having flashpoints of 100°F (37.8°C), or higher, is not considered a flammable liquid

- Solids, other than blasting agents or explosives, as defined in WAC 296-52-417 or 29 CFR 1910.109(a), that:

- Is likely to cause fire through friction, moisture, absorption, spontaneous chemical change or retained heat from manufacturing or processing

OR

- That can be readily ignited (and when ignited burns so vigorously and persistently that it creates a serious hazard)

OR

- When tested by the method described in 16 CFR 1500.44, ignite and burn with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

#### **Flashpoint**

- The minimum temperature at which a liquid gives off an ignitable concentration of vapor, when tested by any of the following measurement methods:

- Tagliabue closed tester. Use this for liquids with a viscosity less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not tend to form a surface film under test. See American National Standard Method of Test for Flashpoint by Tag Closed Tester, Z11.24.1979 (ASTM D 56-79)

- Pensky-Martens closed tester for liquids with a viscosity equal to, or greater than, 45 SUS at 100°F (37.8°C), or for liquids that contain suspended solids, or have a tendency to form a surface film under test. See American National Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester, Z11.7.1979 (ASTM D 93-79)

- Setaflash closed tester: See American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78).

Organic peroxides, which undergo auto accelerating thermal decomposition, are excluded from any of the flashpoint measurement methods specified above.

#### **Foreseeable emergency**

Any potential event that could result in an uncontrolled release of a hazardous chemical into the workplace. Examples of foreseeable emergencies include equipment failure, rupture of containers, or failure of control equipment.

#### **Hazardous chemical**

A chemical, which is a physical or health hazard.

#### **Hazard warning**

Words, pictures, or symbols (alone or in combination), that appear on labels (or other forms of warning such as placards or tags) that communicate specific physical and health hazard(s), (including target organ effects), associated with chemical(s) in a container.

#### **Health hazard**

A chemical that may cause health effects in short or long-term exposed employees based on statistically significant evidence from a single study conducted by using established scientific principles. Health hazards include, but are not limited to, any of the following:

- Carcinogens
- Toxic or highly toxic substances
- Reproductive toxins
- Irritants
- Corrosives

- Sensitizers
- Hepatotoxins (liver toxins)
- Nephrotoxins (kidney toxins)
- Neurotoxins (nervous system toxins)
- Substances that act on the hematopoietic system (blood or blood forming system)
- Substances that can damage the lungs, skin, eyes, or mucous membranes.

#### **Identity**

A chemical or common name listed on the material safety data sheet (MSDS) and label.

#### **Importer**

The first business within the customs territory of the USA that:

- Receives hazardous chemicals produced in other countries

AND

- Supplies them to manufacturers, distributors or employers within the USA.

#### **Material safety data sheet (MSDS)**

Written, printed or electronic information (on paper, microfiche, or on-screen) that informs manufacturers, distributors or employers about the chemical, its hazards and protective measures as required by this rule.

#### **Mixture**

A combination of 2 or more chemicals that retain their chemical identity after being combined.

#### **Organic peroxide**

An organic compound containing the bivalent-0-0-structure. It may be considered a structural derivative of hydrogen peroxide if one or both of the hydrogen atoms has been replaced by an organic radical.

#### **Oxidizer**

A chemical, other than a blasting agent or explosive as defined in WAC 296-52-417 or CFR 1910.109(a), that starts or promotes combustion in other materials, causing fire either of itself or through the release of oxygen or other gases.

#### **Permissible exposure limits (PELs)**

See WAC 296-307-628 for the definition of this term.

#### **Physical hazard**

A chemical that has scientifically valid evidence to show it is one of the following:

- A combustible liquid
- A compressed gas
- Explosive
- Flammable
- An organic peroxide
- An oxidizer
- Pyrophoric
- Unstable (reactive)
- Water reactive.

#### **Produce**

To do one or more of the following:

- Manufacture
- Process
- Formulate
- Blend
- Extract
- Generate
- Emit
- Repackage.

**Purchaser**

An employer who buys one or more hazardous chemicals to use in their workplace.

**Pyrophoric**

Chemicals that ignite spontaneously in the air at a temperature of 130°F (54.4°C) or below.

**Responsible party**

Someone who can provide more information about the hazardous chemical and appropriate emergency procedures.

**Specific chemical identity**

This term applies to chemical substances. It can mean the:

- Chemical name
- Chemical abstracts service (CAS) registry number
- Any other information that reveals the precise chemical designation of the substance.

**Trade secret**

Any confidential:

- Formula
- Pattern
- Process
- Device
- Information
- Collection of information.

The trade secret is used in an employer's business and gives an opportunity to gain an advantage over competitors who do not know or use it.

See WAC 296-62-053 for requirements dealing with trade secrets.

**Unstable (reactive)**

A chemical in its pure state, or as produced or transported, that will vigorously polymerize, decompose, condense, or become self-reactive under conditions of shocks, pressure or temperature.

**Use**

To do one or more of the following:

- Package
- Handle
- React
- Emit
- Extract
- Generate as a by-product
- Transfer.

**Water-reactive**

A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

**Work area**

A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

**Workplace**

The term workplace means an establishment, job site, or project, at one geographical location containing one or more work areas.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-55060, filed 12/21/04, effective 4/2/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-55060, filed 8/8/01, effective 9/1/01.]

**Part Y-2**

**Material Safety Data Sheets and Label Preparation**

**WAC 296-307-560 Scope.** This chapter sets minimum requirements for content and distribution of material safety data sheets (MSDSs) and labels for hazardous chemicals.

• This chapter applies when you do **one or more** of the following:

- Import, produce, or repackage chemicals, including manufactured items (such as bricks, welding rods, and sheet metal) that are not exempt as articles
- Sell or distribute hazardous chemicals to manufacturers, distributors or employers
- Choose not to rely on material safety data sheets (MSDSs) provided by the importer, manufacturer or distributor.

**Note:**

- You are not required to evaluate chemicals or create MSDSs for chemicals you did not produce or import. If you decide to evaluate chemicals or create MSDSs, then the requirements of this chapter will apply to you.
- Use Table 2 to determine which sections in this chapter apply to your workplace.

**Exemptions:**

- All of the following are **always** exempt from this chapter:
  - Ionizing and nonionizing radiation
  - Biological hazards
  - Tobacco and tobacco products
- The chemicals and items listed in Table 1 are exempt from this chapter **under the conditions specified.**

<b>Table 1 Conditional Exemptions From This Chapter</b>	
<b>This chapter does NOT apply to</b>	<b>When</b>
<ul style="list-style-type: none"> <li>• Alcoholic beverages</li> <li><b>OR</b></li> <li>• Foods</li> </ul>	<ul style="list-style-type: none"> <li>• Sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, bar, or tavern)</li> </ul>
<ul style="list-style-type: none"> <li>• An article (manufactured item)</li> </ul>	<ul style="list-style-type: none"> <li>• It is not a fluid or particle</li> <li><b>AND</b></li> <li>• It is formed to a specific shape or design during manufacture for a particular end use function<sup>1</sup></li> <li><b>AND</b></li> <li>• It releases only trace amounts of a hazardous chemical during normal use <b>AND</b> does not pose a physical or health risk to employees</li> </ul>
<ul style="list-style-type: none"> <li>• Consumer products                             <ul style="list-style-type: none"> <li>– Produced or distributed for sale meeting the definition of "consumer products" in the Consumer Product Safety Act (see U.S. Code, Title 15, Chapter 47, section 2052<sup>2</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Both criteria apply:                             <ul style="list-style-type: none"> <li>– They are used in the workplace for the same purpose as intended by the manufacturer or importer</li> </ul> </li> </ul>

Table 1 Conditional Exemptions From This Chapter	
This chapter does NOT apply to	When
<p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Hazardous household products</li> </ul> <p>– Meeting the definition of "hazardous substances" in the Federal Hazardous Substance Act (see U.S. Code, Title 15, Chapter 30, section 1261<sup>2</sup>)</p>	<p>– The duration and frequency of an employee's exposure is no more than the range of exposures that consumers might reasonably experience</p>
<ul style="list-style-type: none"> <li>• Cosmetics</li> </ul>	<ul style="list-style-type: none"> <li>• Packaged and sold in retail establishments</li> </ul>
<ul style="list-style-type: none"> <li>• Drugs</li> </ul> <p>– Meeting the definition for "drugs" in the Federal Food, Drug, and Cosmetic Act (see U.S. Code, Title 21, Chapter 9, Subchapter II, section 321<sup>2</sup>)</p>	<ul style="list-style-type: none"> <li>• In solid, final form (for example, tablets, or pills) for direct administration to the patient</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Packaged and sold in retail establishments (for example, over-the-counter drugs)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Intended for employee consumption while in the workplace (for example, first-aid supplies)</li> </ul>
<ul style="list-style-type: none"> <li>• Hazardous solid wastes</li> </ul> <p>– Meeting the definition of "hazardous wastes" in the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (see U.S. Code, Title 42, Chapter 82, Subchapter I, section 6903<sup>2</sup>)</p>	<ul style="list-style-type: none"> <li>• Subject to the United States Environmental Protection Agency (EPA) regulations<sup>3</sup></li> </ul>
<ul style="list-style-type: none"> <li>• Hazardous substances</li> </ul> <p>– Released into the environment, meeting the definition of "hazardous substances" in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (see U.S. Code, Title 42, Chapter 103, Subchapter I, section 9601<sup>2</sup>)</p>	<ul style="list-style-type: none"> <li>• They are the focus of remedial or removal action being conducted under CERCLA in accordance with EPA regulations (Title 40 of the Code of Federal Regulations (CFR)<sup>3</sup>)</li> </ul>

Table 1 Conditional Exemptions From This Chapter	
This chapter does NOT apply to	When
<ul style="list-style-type: none"> <li>• Hazardous wastes</li> </ul> <p>– Meeting the definition of "dangerous wastes" in the Hazardous Waste Management Act (see chapter 70.105 RCW<sup>4</sup>)</p>	<ul style="list-style-type: none"> <li>• Subject to department of ecology regulations, chapter 173-303 WAC<sup>5</sup>, that address the accumulation, handling and management of hazardous waste, and describe all of the following:                             <ul style="list-style-type: none"> <li>– Safety</li> <li>– Labeling</li> <li>– Personnel training</li> <li>– And other related requirements</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Solid wood</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Wood products (for example, lumber, and paper)</li> </ul>	<ul style="list-style-type: none"> <li>• All of the following apply:                             <ul style="list-style-type: none"> <li>– The material is not treated with hazardous chemicals</li> <li>– The only hazard is potential flammability or combustibility</li> <li>– The product is not expected to be processed (for example, by sanding or sawing)</li> </ul> </li> </ul>

<sup>1</sup>End use is dependent in whole, or in part, upon maintaining the item's original shape or design. If the item will be significantly altered from its original form, it can no longer be considered a manufactured item.

<sup>2</sup>This federal act is included in the United States Code. See <http://www.access.gpo.gov/uscode/usmain.html>.

<sup>3</sup>EPA regulations are included in the Code of Federal Regulations (CFR). See <http://www.epa.gov>.

<sup>4</sup>This state act is included in the Revised Code of Washington (RCW). The RCW compiles all permanent laws of the state. See <http://www.leg.wa.gov/wsladm/default.htm>.

<sup>5</sup>See <http://www.ecy.wa.gov>.

Use Table 2 to find out which sections of this part apply to you. For example, if you import **AND** sell hazardous chemicals **ALL** sections apply. WAC 296-307-56050 applies to all employers covered by the scope of this part.

Table 2 Section Application				
If you	Then the sections marked with an "X" apply			
	56010 - 56015	56025	56030 - 56035	56045
• Import or produce chemicals	X	X		
• Sell or distribute hazardous chemicals to <ul style="list-style-type: none"> <li>– Manufacturers</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>– Distributors</li> </ul> <p><b>OR</b></p>				

Table 2 Section Application				
If you	Then the sections marked with an "X" apply			
	56010 - 56015	56025	56030 - 56035	56045
– Employers (includes retail or wholesale transactions)			X	X
• Choose to NOT rely on MSDSs provided by the importer, manufacturer or distributor	X	X		

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-560, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-560, filed 5/6/03, effective 8/1/03.]

### WAC 296-307-56005 Hazard evaluation.

#### Your responsibility:

To make sure the hazardous chemicals are identified.

#### You must:

Conduct complete hazard evaluations

WAC 296-307-56010

Provide access to hazard evaluation procedures

WAC 296-307-56015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060, 03-10-068, § 296-307-56005, filed 5/6/03, effective 8/1/03.]

### WAC 296-307-56010 Conduct complete hazard evaluations.

#### IMPORTANT:

• Hazard evaluation is a process where hazards of chemicals are identified by reviewing available research or testing information. You are not required to perform your own laboratory research or testing to meet the requirements of this section

– Information from hazard evaluations is used to complete material safety data sheets (MSDSs) and labels

– MSDSs from your suppliers may be used to complete the hazard evaluation for chemicals you produce

– MSDSs and labels are NOT required for chemicals that are determined to be nonhazardous

• Importers and manufacturers are required to develop MSDSs and labels. If you decide to develop your own MSDSs and labels, then this chapter also applies to you.

#### You must:

(1) Describe in writing your procedures for conducting hazard evaluations.

(2) Conduct a complete hazard evaluation for ALL chemicals you produce or import to determine if they are hazardous chemicals.

• Identify and consider available scientific evidence of health and physical hazards

• Evidence that meets the criteria in Table 3 must be used to establish a hazard

• Chemicals identified in a Table 4 source must be regarded as hazardous

[Title 296 WAC—p. 2570]

• The scope of health hazards considered must include the categories in Tables 5 and 6

• If the chemical is a mixture, follow the additional criteria in Table 7

• If you find evidence that meets the criteria in Table 3, use it in your hazard evaluation.

Table 3 Criteria for Hazard Evidence	
Hazard	Criteria
• Health hazard	<ul style="list-style-type: none"> <li>• Where available, use human case reports of health effects</li> <li>AND</li> <li>• One or more studies that               <ul style="list-style-type: none"> <li>– Are based on human populations, if available, and animal populations<sup>1,2</sup></li> </ul> </li> <li>AND</li> <li>– Report statistically significant conclusions of a hazardous effect or health hazard (as defined in this rule)</li> <li>AND</li> <li>– Have been conducted following established scientific principles</li> </ul>
• Physical hazard	<ul style="list-style-type: none"> <li>• Valid evidence that shows a chemical is any one of the following<sup>3</sup>:               <ul style="list-style-type: none"> <li>– A combustible liquid</li> <li>– A compressed gas</li> <li>– Explosive</li> <li>– Flammable</li> <li>– An organic peroxide</li> <li>– An oxidizer</li> <li>– Pyrophoric</li> <li>– Unstable (reactive)</li> <li>– Water-reactive</li> </ul> </li> </ul>

<sup>1</sup>If human data is not available, use results of tests done on animals and other available studies to predict health effects on employees (for example, effects resulting from short and long-term exposures to chemicals).

<sup>2</sup>In vitro studies alone do not generally form the basis of a finding of hazard.

<sup>3</sup>These terms are defined in WAC 296-307-56050.

Chemicals identified in the sources listed in Table 4 must be assumed to be hazardous (including carcinogens and potential carcinogens).

Table 4 Information Sources Identifying Hazardous Chemicals
<ul style="list-style-type: none"> <li>• Sources that address a broad range of hazard categories:               <ul style="list-style-type: none"> <li>– Chapter 296-62 WAC, General Occupational Health Standards, WISHA</li> <li>– 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA)</li> <li>– <i>Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment</i>, American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition).</li> </ul> </li> <li>• Sources that identify carcinogens or potential carcinogens:</li> </ul>

<b>Table 4</b>	
<b>Information Sources Identifying Hazardous Chemicals</b>	
<ul style="list-style-type: none"> <li>– Chapter 296-62 WAC, General Occupational Health Standards, WISHA</li> <li>– 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA)</li> <li>– National Toxicology Program (NTP), Annual Report on Carcinogens (latest edition)</li> <li>– International Agency for Research on Cancer (IARC) Monographs (latest editions).</li> </ul>	
<b>Note:</b>	
<p>The <i>Registry of Toxic Effects of Chemical Substances</i> is published by the National Institute for Occupational Safety and Health (NIOSH) and identifies chemicals found to be potential carcinogens by the NTP and IARC.</p>	

Chemicals meeting Table 5 definitions, along with the criteria for established evidence in Table 3, must be regarded as hazardous.

**Table 5 is NOT intended to present all hazard categories or test methods.** Available scientific data involving other test methods and animal species must also be evaluated to determine a chemical's hazards.

<b>Table 5</b>	
<b>Standard Health Hazard Categories</b>	
<b>A chemical is considered to be</b>	<b>If</b>
<ul style="list-style-type: none"> <li>• A carcinogen</li> </ul>	<ul style="list-style-type: none"> <li>• The International Agency for Research on Cancer (IARC) considers it to be a carcinogen or potential carcinogen</li> <li><b>OR</b></li> <li>• The National Toxicity Program (NTP) (latest edition) lists it as a carcinogen or potential carcinogen</li> <li><b>OR</b></li> <li>• It is regulated by WISHA or OSHA as a carcinogen</li> </ul>
<ul style="list-style-type: none"> <li>• Corrosive</li> </ul>	<ul style="list-style-type: none"> <li>• It causes visible destruction of, or irreversible alterations in, living tissue (not inanimate surfaces) by chemical action at the site of contact</li> <li>Example:                             <ul style="list-style-type: none"> <li>– A chemical is corrosive if tested on the intact skin of albino rabbits by a method described by the U.S. Department of Transportation (in Appendix A to 49 CFR Part 173) and it destroys or changes (irreversibly) the structure of the tissue at the contact site after a four-hour exposure period</li> </ul> </li> </ul>

<b>Table 5</b>	
<b>Standard Health Hazard Categories</b>	
<b>A chemical is considered to be</b>	<b>If</b>
<ul style="list-style-type: none"> <li>• Toxic</li> </ul>	<ul style="list-style-type: none"> <li>• It has a median lethal dose (LD50) greater than 50 milligrams per kilogram, but no more than 500 milligrams per kilogram of body weight, when administered orally to albino rats weighing between 200 - 300 grams each</li> <li><b>OR</b></li> <li>• It has a median lethal dose (LD50) greater than 200 milligrams per kilogram, but not more than 1,000 milligrams per kilogram, of body weight when administered by continuous contact for twenty-four hours (or less if death occurs within twenty-four hours) with the bare skin of albino rabbits weighing between 2 - 3 kilograms each</li> <li><b>OR</b></li> <li>• It has a median lethal concentration (LC50), in air:                             <ul style="list-style-type: none"> <li>– Greater than 200 parts per million, but not more than 2,000 parts per million (by volume of gas or vapor)</li> </ul> </li> <li><b>OR</b></li> <li>– Greater than 2 milligrams per liter, but not more than 20 milligrams per liter, of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats, weighing between 200 - 300 grams each</li> </ul>
<ul style="list-style-type: none"> <li>• Highly toxic</li> </ul>	<ul style="list-style-type: none"> <li>• It has a median lethal dose (LD50) of 50 milligrams, or less, per kilogram of body weight when administered orally to albino rats weighing between 200 - 300 grams each</li> <li><b>OR</b></li> <li>• It has a median lethal dose (LD50) of 200 milligrams, or less, per kilogram of body weight when administered by continuous contact for twenty-four hours (or less if death occurs within twenty-four hours) with the bare skin of albino rabbits weighing between 2 - 3 kilograms each</li> <li><b>OR</b></li> <li>• It has a median lethal concentration of (LC50), in air, of:                             <ul style="list-style-type: none"> <li>– 200 parts per million (by volume), or less, of gas or vapor</li> </ul> </li> <li><b>OR</b></li> </ul>

<b>A chemical is considered to be</b>	<b>If</b>
	<ul style="list-style-type: none"> <li>- 2 milligrams per liter, or less, of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 - 300 grams each</li> </ul>
<ul style="list-style-type: none"> <li>• An irritant</li> </ul>	<ul style="list-style-type: none"> <li>• It is <b>NOT</b> corrosive, but causes a reversible inflammatory effect on living tissue by chemical action at the contact site</li> </ul> <p>Examples:</p> <ul style="list-style-type: none"> <li>- The chemical is a skin irritant when tested on the intact skin of albino rabbits (by the methods of 16 CFR 1500.41) for four hours exposure (or by other appropriate techniques), and the exposure results in an empirical score of five or more</li> <li>- A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques</li> </ul>
<ul style="list-style-type: none"> <li>• A sensitizer</li> </ul>	<ul style="list-style-type: none"> <li>• It causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure</li> </ul>

Categories provided in Table 6 illustrate the broad range of target organ effects that must be considered when conducting hazard evaluations. Chemicals meeting Table 6 definitions, along with the criteria for established evidence in Table 3, must be regarded as hazardous.

Examples provided in Table 6 are **NOT** intended to be a complete list.

<b>Category</b>	<b>Definition</b>	<b>Examples of Signs and Symptoms</b>	<b>Examples of Chemicals</b>
Hepatotoxins	Cause liver damage	<ul style="list-style-type: none"> <li>• Jaundice</li> <li>• Liver enlargement</li> </ul>	<ul style="list-style-type: none"> <li>• Carbon tetrachloride</li> <li>• Nitrosamines</li> </ul>
Nephrotoxins	Cause kidney damage	<ul style="list-style-type: none"> <li>• Edema</li> <li>• Proteinuria</li> </ul>	<ul style="list-style-type: none"> <li>• Halogenated hydrocarbons</li> <li>• Cadmium</li> </ul>
Neurotoxins	Cause primary toxic effects on the nervous system	<ul style="list-style-type: none"> <li>• Narcosis</li> <li>• Behavioral changes</li> <li>• Decrease in motor functions</li> </ul>	<ul style="list-style-type: none"> <li>• Mercury</li> <li>• Carbon disulfide</li> <li>• Lead</li> </ul>
Chemicals that act on the • Blood <b>OR</b> • Hematopoietic (blood forming) system	<ul style="list-style-type: none"> <li>• Decrease hemoglobin function</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Deprive the body tissues of oxygen</li> </ul>	<ul style="list-style-type: none"> <li>• Cyanosis</li> <li>• Loss of consciousness</li> </ul>	<ul style="list-style-type: none"> <li>• Carbon monoxide</li> <li>• Cyanides</li> <li>• Benzene</li> </ul>

<b>Category</b>	<b>Definition</b>	<b>Examples of Signs and Symptoms</b>	<b>Examples of Chemicals</b>
Chemicals that damage the lungs	<ul style="list-style-type: none"> <li>• Irritate lungs</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Damage pulmonary tissue</li> </ul>	<ul style="list-style-type: none"> <li>• Cough</li> <li>• Tightness in chest</li> <li>• Shortness of breath</li> </ul>	<ul style="list-style-type: none"> <li>• Silica</li> <li>• Asbestos</li> </ul>
Reproductive toxins	Affect reproductive capabilities, including: <ul style="list-style-type: none"> <li>• Chromosomal damage (mutation)</li> <li>• Effects on fetuses (teratogenesis)</li> </ul>	<ul style="list-style-type: none"> <li>• Birth defects</li> <li>• Sterility</li> </ul>	<ul style="list-style-type: none"> <li>• Lead</li> <li>• 1,2-Dibromo-3-chloropropane (DBCP)</li> <li>• Nitrous oxide</li> </ul>
Cutaneous (skin) hazards	Affect the dermal layer of the body	<ul style="list-style-type: none"> <li>• Defatting of the skin</li> <li>• Rashes</li> <li>• Irritation</li> </ul>	<ul style="list-style-type: none"> <li>• Ketones</li> <li>• Chlorinated compounds</li> </ul>
Eye hazards	Affect the eye or ability to see	<ul style="list-style-type: none"> <li>• Conjunctivitis</li> <li>• Corneal damage</li> </ul>	<ul style="list-style-type: none"> <li>• Organic solvents</li> <li>• Acids</li> </ul>

<b>If a mixture</b>	<b>Then</b>
<ul style="list-style-type: none"> <li>• Has been thoroughly tested as a whole for a physical or health hazard</li> </ul>	<ul style="list-style-type: none"> <li>• You must use those results</li> </ul>
<ul style="list-style-type: none"> <li>• Has <b>NOT</b> been tested as a whole for a health hazard</li> </ul>	<ul style="list-style-type: none"> <li>• You must:                             <ul style="list-style-type: none"> <li>- Evaluate <b>EACH</b> ingredient in the mixture to determine the hazards</li> <li>- Consider the mixture to have the same hazard as each ingredient determined to be hazardous</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Has <b>NOT</b> been tested as a whole for physical hazards</li> </ul>	<ul style="list-style-type: none"> <li>• You must:                             <ul style="list-style-type: none"> <li>• Use any scientifically valid data available to evaluate the potential physical hazards of the mixture</li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-56010, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-56015 Provide access to hazard evaluation procedures.**

**You must:**

• Provide access to your written hazard evaluation procedures when requested by any of the following:

- Employees
- Designated representatives of employees
- Representatives of the department of labor and industries
- Representatives of the National Institute for Occupational Safety and Health (NIOSH).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-56015, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-56020 Material safety data sheets.**

**Your responsibility:**

To provide complete and accurate material safety data sheets (MSDSs).

**You must:**

Develop or obtain MSDSs

WAC 296-307-56025

Provide MSDSs

WAC 296-307-56030

Follow-up if an MSDS is not provided

WAC 296-307-56035.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-10-068, § 296-307-56020, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-56025 Develop or obtain material safety data sheets (MSDSs).**

**You must:**

- Develop or obtain a complete and accurate material safety data sheet (MSDS) for each hazardous chemical or mixture according to ALL of the following:

- ALL information in Table 8 must be completed. If there is no relevant information for a required item, this must be noted. Blank spaces are not permitted.

- Note:**
- No specific format is required for MSDSs; however, an example format (OSHA form 174) can be found online at: <http://www.osha.gov>
  - One MSDS can be developed for a group of complex mixtures (for example, jet fuels or crude oil) IF the health and physical hazards of the mixtures are similar (the amounts of chemicals in the mixture may vary).

- Content of MSDSs must accurately represent the available scientific evidence.

**Note:** You may report results of scientifically valid studies that tend to refute findings of hazards.

- MSDSs must be in English.

**Note:** You may develop copies of MSDSs in other languages.

**You must:**

- Revise an MSDS when you become aware of new and significant information regarding the hazards of a chemical, or how to protect against the hazards

- Within three months after you first become aware of the information

**OR**

- Before the chemical is reintroduced into the workplace if the chemical is no longer being used, produced or imported.

<b>Table 8 Information Required on MSDSs</b>
• The chemical's identity as it appears on the label
• The date the MSDS was prepared or updated
• A contact for additional information about the hazardous chemical and appropriate emergency procedures Include all of the following: <ul style="list-style-type: none"> <li>– Name</li> <li>– Address</li> <li>– Telephone number of the responsible party preparing or distributing the MSDS</li> </ul>
• The chemical's hazardous ingredients <sup>1</sup> as determined by your hazard evaluation <ul style="list-style-type: none"> <li>– For a <b>single substance chemical</b>, include the chemical and common name(s) of the substance</li> <li>– For <b>mixtures</b> tested as a whole</li> </ul>

<b>Table 8 Information Required on MSDSs</b>
<ul style="list-style-type: none"> <li>■ Include the common name(s) of the mixture <b>AND</b></li> <li>■ List the chemical and common name(s) of ingredients that contribute to the known hazards                             <ul style="list-style-type: none"> <li>– For <b>mixtures</b> NOT tested as a whole, list the chemical and common name(s) of hazardous ingredients                                     <ul style="list-style-type: none"> <li>■ That make up 1% or more of the mixture, by weight or volume, including carcinogens (if 0.1% concentration or more, by weight or volume)</li> </ul> </li> <li>– If ingredients are less than the above concentrations but may present a health risk to employees (for example, allergic reaction or exposure could exceed the permissible exposure limits, or PEL) they must be listed here</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Exposure limits for airborne concentrations. Include ALL of the following, when they exist:                             <ul style="list-style-type: none"> <li>– WISHA or OSHA PELs<sup>2</sup> <ul style="list-style-type: none"> <li>■ The 8-hour time weighted average (TWA)</li> <li>■ The short-term exposure limit (STEL), if available</li> <li>■ Ceiling values, if available</li> </ul> </li> <li>– Threshold limit values (TLVs) including 8-hour TWAs, STELs, and ceiling values</li> <li>– Other exposure limits used or recommended by the employer preparing the MSDS</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Physical and chemical characteristics                             <ul style="list-style-type: none"> <li>– For example, boiling point, vapor pressure, and odor</li> </ul> </li> <li>• Fire, explosion data, and related information                             <ul style="list-style-type: none"> <li>– For example, flashpoint, flammable and explosion limits, extinguishing media, and unusual fire or explosion hazards</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Physical hazards of the chemical including reactivity information                             <ul style="list-style-type: none"> <li>– For example, incompatibilities, decomposition products, by-products, and conditions to avoid</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Health hazard information including ALL of the following:                             <ul style="list-style-type: none"> <li>– Primary routes of exposure</li> <li>• For example, inhalation, ingestion, and skin absorption or other contact<sup>3</sup> <ul style="list-style-type: none"> <li>– Health effects (or hazards) associated with:                                     <ul style="list-style-type: none"> <li>■ Short-term exposure<sup>4</sup></li> <li><b>AND</b></li> <li>■ Long-term exposure<sup>4</sup></li> </ul> </li> <li>– Whether the chemical is listed or described as a carcinogen or potential carcinogen in the latest editions of each of the following:                                     <ul style="list-style-type: none"> <li>■ The National Toxicology Program (NTP) Annual Report on Carcinogens</li> <li><b>OR</b></li> <li>■ The International Agency for Research on Cancer (IARC) Monographs as a potential carcinogen</li> <li><b>OR</b></li> <li>■ WISHA or OSHA rules</li> </ul> </li> <li>– Signs and symptoms of exposure<sup>5</sup></li> <li>– Medical conditions generally recognized as being aggravated by exposure</li> </ul> </li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Emergency and first-aid procedures</li> </ul>

<b>Table 8 Information Required on MSDSs</b>
<ul style="list-style-type: none"> <li>• Generally applicable precautions for safe handling and use known to the employer preparing the MSDS               <ul style="list-style-type: none"> <li>– For example, appropriate procedures for clean-up of spills and leaks, waste disposal method, precautions during handling and storing</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Generally applicable and appropriate control measures known to the employer preparing the MSDS, including ALL of the following:               <ul style="list-style-type: none"> <li>– Engineering controls (for example, general or local exhaust ventilation)</li> <li>– Work practices</li> <li>– Personal protective equipment (PPE)</li> <li>– Personal hygiene practices</li> <li>– Protective measures during repair and maintenance of contaminated equipment</li> </ul> </li> </ul>

<sup>1</sup>The identities of some chemicals may be protected as trade secret information (see chapter 296-62 WAC, Part B-1, Trade secrets).

<sup>2</sup>WISHA PEL categories are defined, and values are provided, in chapter 296-307 WAC, Part Y-6.

<sup>3</sup>A "skin notation" listed with either an ACGIH TLV or WISHA/OSHA PEL indicates that skin absorption is a primary route of exposure.

<sup>4</sup>Examples of:

- Short-term health effects (or hazards) include eye irritation, skin damage caused by contact with corrosives, narcosis, sensitization, and lethal dose.

- Long-term health effects (or hazards) include cancer, liver degeneration, and silicosis.

<sup>5</sup>Signs and symptoms of exposure to hazardous substances include those that:

- Can be measured such as decreased pulmonary function

AND

- Are subjective such as feeling short of breath.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-56025, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-56025, filed 5/6/03, effective 8/1/03.]

### **WAC 296-307-56030 Provide MSDSs for products shipped, transferred or sold over-the-counter.**

#### **You must:**

- Provide the correct MSDS to manufacturers, distributors and employers:

- With the initial shipment or transfer of the product

AND

- With the first shipment or transfer after an MSDS is updated

AND

- Whenever one is requested.

**Note:**

- MSDSs may be provided separately from containers as long as they are provided before or at the same time as the containers. For example, you may fax, or e-mail the MSDS
- You are NOT required to provide MSDSs to retailers who inform you they
  - Do not sell the product to commercial accounts

AND

- Do not open the sealed product containers for use in their workplace.

#### **You must:**

- Follow the requirements in Table 9 for chemicals sold over-the-counter.

[Title 296 WAC—p. 2574]

<b>Table 9 Requirements for Chemicals Sold Over-the-Counter (NOT Shipped)</b>	
<b>If you are a</b>	<b>Then</b>
<ul style="list-style-type: none"> <li>• Retail distributor WITH commercial accounts</li> </ul>	<ul style="list-style-type: none"> <li>• Provide an MSDS to employers with commercial accounts when requested</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Post a sign, or otherwise inform employers, that MSDSs are available</li> </ul>
<ul style="list-style-type: none"> <li>• Retail distributor WITHOUT commercial accounts</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the employer, when requested, with ALL of the following:               <ul style="list-style-type: none"> <li>– Name</li> <li>– Address</li> <li>– Telephone number of the chemical manufacturer, importer, or distributor who can provide an MSDS</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Wholesale distributor selling products over-the-counter to employers</li> </ul>	<ul style="list-style-type: none"> <li>• Provide an MSDS to employers with commercial accounts when requested</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Post a sign, or otherwise inform employers, that MSDSs are available</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060, 03-10-068, § 296-307-56030, filed 5/6/03, effective 8/1/03.]

### **WAC 296-307-56035 Follow-up if an MSDS is not provided.**

#### **You must:**

- Obtain an MSDS from the chemical manufacturer, distributor or importer as soon as possible, if an MSDS is not provided for a shipment labeled as a hazardous chemical.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060, 03-10-068, § 296-307-56035, filed 5/6/03, effective 8/1/03.]

### **WAC 296-307-56040 Labeling.**

#### **Your responsibility:**

To provide employers with containers of hazardous chemicals that are properly labeled.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060, 03-10-068, § 296-307-56040, filed 5/6/03, effective 8/1/03.]

### **WAC 296-307-56045 Label containers of hazardous chemicals.**

**Exemption:** Containers are exempt from this section if ALL hazardous contents are listed in Table 11.

#### **You must:**

- Make sure every container of hazardous chemicals leaving the workplace is properly labeled. This includes ALL of the following:

- The identity of the hazardous chemical (the chemical or common name) that matches the identity used on the MSDS

- An appropriate hazard warning

- The name and address of the chemical manufacturer, importer, or other responsible party

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– Make sure labeling does not conflict with the requirements of:

- The Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.)

AND

• Regulations issued under the act by the U.S. Department of Transportation (Title 49 of the Code of Federal Regulations, Parts 171 through 180). See <http://www.dot.gov>

– Revise labels within three months of becoming aware of new and significant information about chemical hazards

– Provide revised labels on containers beginning with the first shipment after a revision, to manufacturers, distributors or employers

– Revise the label when a chemical is not currently used, produced or imported, before:

- You resume shipping (or transferring) the chemical

OR

- The chemical is reintroduced in the workplace

– Label information

- Clearly written in English

AND

- Prominently displayed on the container.

**Reference:** Additional labeling requirements for specific hazardous chemicals (for example, asbestos and cadmium) are found in chapter 296-62 WAC, General occupational health standards (see parts F, G, and I-1 of that chapter).

**Note:** When the conditions specified in Table 10 are met for the solid material products listed, you are not required to provide labels for every shipment.

<b>Table 10 Labeling for Solid Materials</b>	
<b>You need only send labels with the first shipment, IF the product is</b>	
<b>Whole grain</b>	<p><b>And</b></p> <ul style="list-style-type: none"> <li>• It is shipped to the same customer</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• No hazardous chemicals are part of or known to be present with the product which could expose employees during handling                             <ul style="list-style-type: none"> <li>– For example, cutting fluids on solid metal, and pesticides with grain</li> </ul> </li> </ul>
<b>Solid untreated wood</b>	
<b>Solid metal</b> For example: Steel beams, metal castings	
<b>Plastic items</b>	

**Exemptions:** The chemicals (and items) listed in Table 11 are EXEMPT from THIS SECTION under the conditions specified. Requirements in other sections still apply.

<b>Table 11 Conditional Label Exemptions</b>	
<b>This section does not apply to</b>	<b>When the product is</b>
<ul style="list-style-type: none"> <li>• Pesticides                             <ul style="list-style-type: none"> <li>– Meeting the definition of "pesticides" in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (see Title 7, U.S.C. Chapter 6, Subchapter II, section 136<sup>1</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Subject to                             <ul style="list-style-type: none"> <li>– Labeling requirements of FIFRA<sup>1</sup></li> </ul> </li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>– Labeling regulations issued under FIFRA by the United States Environmental Protection Agency (EPA) (see Title 40 of the Code of Federal Regulations<sup>2</sup>)</li> </ul>
<ul style="list-style-type: none"> <li>• A chemical substance or mixture                             <ul style="list-style-type: none"> <li>– Meeting the definition of "chemical substance" or "mixture" in the Toxic Substance Control Act (TSCA) (see Title 15 U.S.C. Chapter 53, Subchapter II, Section 2602<sup>1</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Subject to                             <ul style="list-style-type: none"> <li>– Labeling requirements of TSCA<sup>1</sup></li> </ul> </li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>– Labeling requirements issued under TSCA by the EPA (see Title 40 of the Code of Federal Regulations<sup>2</sup>)</li> </ul>
<ul style="list-style-type: none"> <li>• Each of the following                             <ul style="list-style-type: none"> <li>– Food</li> <li>– Food additives</li> <li>– Color additives</li> <li>– Drugs</li> <li>– Cosmetics</li> <li>– Medical devices or products</li> <li>– Veterinary devices or products</li> <li>– Materials intended for use in these products (for example: Flavors, and fragrances)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Subject to:                             <ul style="list-style-type: none"> <li>– Labeling requirements in Federal Food, Drug, and Cosmetic Act, Virus-Serum Toxin Act of 1913, and issued regulations enforced by the United States Food and Drug Administration (see Title 21 Parts 101-180 in the Code of Federal Regulations<sup>3</sup>)</li> </ul> </li> </ul> <p>OR</p>

Table 11 Conditional Label Exemptions	
This section does not apply to	When the product is
<ul style="list-style-type: none"> <li>• As defined in                             <ul style="list-style-type: none"> <li>– The Federal Food, Drug, and Cosmetic Act (see Title 21 U.S.C. Chapter 9, Subchapter II, Section 321<sup>1</sup>)</li> </ul> </li> <li>OR</li> <li>– The Virus-Serum Toxin Act of 1913 (see Title 21 U.S.C. Chapter 5, Section 151 et seq.<sup>1</sup>)</li> <li>OR</li> <li>– Regulations issued under these acts (see Title 21 Part 101 in the Code of Federal Regulations, and Title 9, in the Code of Federal Regulations<sup>3</sup>)</li> </ul>	<ul style="list-style-type: none"> <li>– Department of Agriculture (see Title 9, in the Code of Federal Regulations<sup>3</sup>)</li> </ul>
<ul style="list-style-type: none"> <li>• Each of the following:                             <ul style="list-style-type: none"> <li>– Distilled spirits (beverage alcohols)</li> </ul> </li> <li>AND</li> <li>– Wine</li> </ul>	<ul style="list-style-type: none"> <li>• Subject to:                             <ul style="list-style-type: none"> <li>– Labeling requirements of Federal Alcohol Administration Act<sup>1</sup></li> </ul> </li> <li>AND</li> <li>– Labeling regulations issued under Federal Alcohol Administration Act by the Bureau of Alcohol, Tobacco, and Firearms (see Title 27 in the Code of Federal Regulations<sup>3</sup>)</li> </ul>
<ul style="list-style-type: none"> <li>AND</li> <li>– Malt beverage</li> <li>• As defined in                             <ul style="list-style-type: none"> <li>– The Federal Alcohol Administration Act (see Title 27 U.S.C. Section 201<sup>1</sup>)</li> </ul> </li> <li>AND</li> <li>– Regulations issued under this act (see Title 27 in the Code of Federal Regulations<sup>3</sup>)</li> </ul>	

Table 11 Conditional Label Exemptions	
This section does not apply to	When the product is
<ul style="list-style-type: none"> <li>• Consumer products</li> <li>AND</li> <li>• Hazardous substances                             <ul style="list-style-type: none"> <li>– As defined in the Consumer Product Safety Act (see 15 U.S.C. 2051 et seq.<sup>1</sup>)</li> </ul> </li> <li>AND</li> <li>– The Federal Hazardous Substances Act (see 15 U.S.C. 1261 et seq.<sup>1</sup>)</li> </ul>	<ul style="list-style-type: none"> <li>• Subject to:                             <ul style="list-style-type: none"> <li>– A consumer product safety or labeling requirement of the Consumer Product Safety Act or Federal Hazardous Substances Act<sup>1</sup></li> </ul> </li> <li>OR</li> <li>– Regulations issued under these acts by the Consumer Product Safety Commission (see Title 16 in the Code of Federal Regulations<sup>3</sup>)</li> </ul>
<ul style="list-style-type: none"> <li>• Agricultural seed</li> <li>AND</li> <li>• Vegetable seed treated with pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Labeled as required by                             <ul style="list-style-type: none"> <li>– The Federal Seed Act (see Title 7 U.S.C. Chapter 37 Section 1551 et seq.<sup>1</sup>)</li> </ul> </li> <li>AND</li> <li>– Labeling requirements issued under Federal Seed Act by the United States Department of Agriculture<sup>1</sup></li> </ul>

<sup>1</sup>This federal act is included in the United States Code. See <http://www.access.gpo.gov/uscode/usmain.html>.

<sup>2</sup>See <http://www.epa.gov>.

<sup>3</sup>See <http://www.access.gpo.gov/nara/cfr/index.html>.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-08-087, § 296-307-56045, filed 4/4/06, effective 9/1/06; 03-10-068, § 296-307-56045, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-56050 Definitions.** The following definitions apply to this chapter:

**Article (manufactured item)**

A manufactured item that

- Is not a fluid or particle

AND

- Is formed to a specific shape or design during manufacture for a particular end use function

AND

- Releases only trace amounts of a hazardous chemical during normal use and does not pose a physical or health risk to employees.

**Chemical**

- An element or mixture of elements

**OR**

- A compound or mixture of compounds

**OR**

- A mixture of elements and compounds

Included are manufactured items (such as bricks, welding rods and sheet metal) that are not exempt as an article.

**Chemical name**

- The scientific designation of a chemical developed by the
  - International union of pure and applied chemistry (IUPAC)

**OR**

- Chemical abstracts service (CAS) rules of nomenclature

**OR**

- A name that clearly identifies the chemical for the purpose of conducting a hazard evaluation.

**Combustible liquid**

Liquids with a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). A mixture with at least 99% of its components having flashpoints of 200°F (93.3°C), or higher, is not considered a combustible liquid.

**Commercial account**

An arrangement where a retailer is selling hazardous chemicals to an employer

- Generally in large quantities over time

**OR**

- At costs below regular retail price.

**Common name**

Any designation or identification used to identify a chemical other than the chemical name, such as a

- Code name or number

**OR**

- Trade or brand name

**OR**

- Generic name.

**Compressed gas**

• A contained gas or mixture of gases with an absolute pressure greater than:

- 40 psi at 70°F (21.1°C)

**OR**

- 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C)

**OR**

- A liquid with a vapor pressure greater than 40 psi at 100°F (37.8°C), as determined by ASTM D323-72.

**Container**

A vessel, other than a pipe or piping system, that holds a hazardous chemical. Examples include:

- Bags
- Barrels
- Bottles
- Boxes
- Cans
- Cylinders
- Drums
- Reaction vessels
- Storage tanks
- Rail cars.

**Designated representative**

- An individual or organization with written authorization from an employee

**OR**

- A recognized or certified collective bargaining agent (not necessarily authorized by an employee)

**OR**

- A legal representative of a deceased or legally incapacitated employee.

**Distributor**

A business that supplies hazardous chemicals to other employers. Included are employers who conduct retail and wholesale transactions.

**Explosive**

A chemical that causes a sudden, almost instant release of pressure, gas, and heat when exposed to a sudden shock, pressure, or high temperature.

**Flammable**

A chemical in one of the following categories:

- Aerosols that, when tested using a method described in 16 CFR 1500.45, yield either a:

- Flame projection of more than eighteen inches at full valve opening

**OR**

- A flashback (a flame extending back to the valve) at any degree of valve opening

- Gases that, at the temperature and pressure of the surrounding area, form a:

- Flammable mixture with air at a concentration of thirteen percent, by volume, or less

**OR**

- Range of flammable mixtures with air wider than twelve percent, by volume, regardless of the lower limit

- Liquids with a flashpoint below 100°F (37.8°C). A mixture with at least ninety-nine percent of its components having flashpoints of 100°F (37.8°C), or higher, is not considered a flammable liquid

- Solids, other than blasting agents or explosives, as defined in WAC 296-52-417 or 29 CFR 1910.109(a), that:

- Is likely to cause fire through friction, moisture, absorption, spontaneous chemical change or retained heat from manufacturing or processing

**OR**

- That can be readily ignited (and when ignited burns so vigorously and persistently that it creates a serious hazard)

**OR**

- When tested by the method described in 16 CFR 1500.44, ignite and burn with a self-sustained flame at a rate greater than 1/10th of an inch per second along its major axis.

**Flashpoint**

The minimum temperature at which a liquid gives off an ignitable concentration of vapor, when tested by any of the following measurement methods:

- Tagliabue closed tester. Use this for liquids with a viscosity less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not tend to form a surface film under test. See American National Standard Method of Test for Flashpoint by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)

- Pensky-Martens closed tester. Use this for liquids with a viscosity equal to, or greater than, 45 SUS at 100°F (37.8°C) or for liquids that contain suspended solids or have a tendency to form a surface film under test. See American National Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)

- Setaflash closed tester. See American National Standard Method of Test for Flashpoint by Setaflash Closed Tester (ASTM D 3278-78)

Organic peroxides, which undergo auto accelerating thermal decomposition, are excluded from any of the flashpoint measurement methods specified above.

#### **Hazardous chemical**

A chemical, which is a physical or health hazard.

#### **Hazard warning**

Words, pictures or symbols (alone or in combination) that appear on labels (or other forms of warning such as placards or tags) that communicate specific physical and health hazards (including target organ effects) associated with chemicals in a container.

#### **Health hazard**

A chemical that may cause health effects in short or long-term exposed employees based on statistically significant evidence from a single study conducted by using established scientific principles.

Health hazards include, but are not limited to, any of the following:

- Carcinogens
- Toxic or highly toxic substances
- Reproductive toxins
- Irritants
- Corrosives
- Sensitizers
- Hepatotoxins (liver toxins)
- Nephrotoxins (kidney toxins)
- Neurotoxins (nervous system toxins)
- Substances that act on the hematopoietic system (blood or blood forming system)
- Substances that can damage the lungs, skin, eyes, or mucous membranes.

#### **Identity**

A chemical or common name listed on the material safety data sheet (MSDS) and label.

#### **Importer**

The first business, within the Customs Territory of the United States, that receives hazardous chemicals produced in other countries and supplies them to manufacturers, distributors or employers within the United States.

#### **Label**

Written, printed, or graphic material displayed on, or attached to, a container of hazardous chemicals.

#### **Manufacturer**

An employer with a workplace where one or more chemicals (including items not exempt as "articles," see Table 1 in this part) are produced for use or distribution.

#### **Material safety data sheet (MSDS)**

Written, printed or electronic information (on paper, microfiche, or on-screen) that informs manufacturers, distributors or employers about the chemical, its hazards and protective measures as required by this rule.

#### **Mixture**

A combination of two or more chemicals that retain their chemical identity after being combined.

#### **Organic peroxide**

An organic compound containing the bivalent-O-O-structure. It may be considered a structural derivative of hydrogen peroxide if one or both of the hydrogen atoms has been replaced by an organic radical.

#### **Oxidizer**

A chemical, other than a blasting agent or explosive as defined in WAC 296-52-417 or 29 CFR 1910.109(a), that starts or promotes combustion in other materials, causing fire either of itself or through the release of oxygen or other gases.

#### **Permissible exposure limits**

See WAC 296-307-628, for definition of this term.

#### **Physical hazards**

A chemical that has scientifically valid evidence to show it is one of the following:

- A combustible liquid
- A compressed gas
- Explosive
- Flammable
- An organic peroxide
- An oxidizer
- Pyrophoric
- Unstable (reactive)
- Water-reactive.

#### **Produce**

To do one or more of the following:

- Manufacture
- Process
- Formulate
- Blend
- Extract
- Generate
- Emit
- Repackage.

#### **Pyrophoric**

Chemicals that ignite spontaneously in the air at a temperature of 130°F (54.4°C) or below.

#### **Responsible party**

Someone who can provide more information about the hazardous chemical and appropriate emergency procedures.

#### **Retailer**

See "distributor."

#### **Threshold limit values (TLVs)**

Airborne concentrations of substances established by the American Conference of Governmental Industrial Hygienists (ACGIH), and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse health effects.

TLVs are specified in the most recent edition of the *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices* and include the following categories:

- Threshold limit value-time-weighted average (TLV-TWA)
- Threshold limit value-short-term exposure limit (TLV-STEL)
- Threshold limit value-ceiling (TLV-C).

**Unstable (reactive)**

A chemical in its pure state, or as produced or transported, that will vigorously polymerize, decompose, condense, or become self-reactive under conditions of shocks, pressure or temperature.

**Use**

To do one or more of the following:

- Package
- Handle
- React
- Emit
- Extract
- Generate as a by-product
- Transfer.

**Water-reactive**

A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

**Wholesaler**

See "distributor."

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-56050, filed 12/21/04, effective 4/2/05; 03-10-068, § 296-307-56050, filed 5/6/03, effective 8/1/03.]

**WAC 296-307-570 Lighting rule.** Your responsibility: To provide and maintain adequate lighting in your workplace.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-570, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-57005 Provide and maintain adequate lighting.**

**Note:** This section establishes minimal levels of lighting for safety purposes only. Guidelines pertaining to optimal levels of lighting and illumination may be found in Practice for Industrial Lighting, ANSI/IES RP7-1979.

**You must:**

- Provide and maintain adequate lighting for all work activities in your workplace. See the following table.

<b>Lighting Table</b>		
<b>Activity</b>	<b>Minimum Acceptable average lighting level in an area: (Foot-candles)</b>	<b>Any one single measurement used to determine the average lighting level* cannot be less than: (Foot-candles)</b>
Indoor task	10	5
Outdoor task	5	2.5
Nontask activities for both indoor and outdoor	3	1.5

- Lighting levels must be measured at thirty inches above the floor/working surface or at the task.

**You must:**

- Have adequate light for employees to see nearby objects that might be potential hazards or to see to operate emergency controls or other equipment, if general lighting is not available.

**Note:** • Lighting levels can be measured with a light meter.  
• Conversion information: 1 foot candle = 1 lumen incident per square foot = 10.76 lux.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-57005, filed 8/8/01, effective 9/1/01.]

(2007 Ed.)

**WAC 296-307-590 Environmental tobacco smoke in the office—Summary.**

**Your responsibility:**

To eliminate exposure to environmental tobacco smoke in your office work environment

**You must:**

Prohibit tobacco smoke in your office work environment.

*WAC 296-307-59005*

**Note:** This rule does not preempt any federal, state, municipal, or other local authority's regulation of indoor smoking that is more protective than this section.

**Definitions:** *Office work environment* is an indoor or enclosed occupied space where clerical work, administration, or business is carried out.

In addition, it includes:

- Other workplace spaces controlled by the employer and used by office workers, such as cafeterias, meeting rooms, and washrooms.
- Office areas of manufacturing and production facilities, not including process areas.
- Office areas of businesses such as food and beverage establishments, agricultural operations, construction, commercial trade, services, etc.

*Smoking*

A person is smoking if they are:

- Lighting up
- Inhaling
- Exhaling
- Carrying a pipe, cigar or cigarette of any kind that is burning.

**Link:** For work environments outside the office, contact your local health department using the link <http://www.secondhandsmokesyou.com> or by calling them directly.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-22-023, § 296-307-590, filed 10/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-590, filed 8/8/01, effective 9/1/01.]

**WAC 296-307-59005 Prohibit tobacco smoke in your office work environment.**

**EXEMPTION:** The minimum criteria specified in this rule do not apply to outdoor structures provided for smokers such as gazebos or lean-tos that maintain the twenty-five-foot distance from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

**You must:**

- (1) Prohibit smoking in your office work environment.
- (2) Use administrative controls to prevent tobacco smoke from entering your office from outside the building.

- Make sure that outside smoking areas used by your employees are at least twenty-five feet from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-22-023, § 296-307-59005, filed 10/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-17-033, § 296-307-59005, filed 8/8/01, effective 9/1/01.]

**Part Y-3  
Lighting**

**Part Y-4  
Environmental Tobacco Smoke in the Office**

**Part Y-5  
Respirators**

**WAC 296-307-594 Scope.** This part applies to all use of respirators at work.

**IMPORTANT:**

Before you decide to use respirators, you are required to evaluate respiratory hazards and implement control methods as outlined in WAC 296-307-624 through 296-307-628, Respiratory hazards.

The term "respiratory hazards" will be used throughout this part to refer to oxygen deficient conditions and harmful airborne hazards.

**Definition:**

Respirators are a type of personal protective equipment designed to protect the wearer from respiratory hazards.

You can use Table 1 for general guidance on which sections apply to you.

**Table 1  
Sections that apply to your workplace**

If employees...	Then the sections marked with an "X" apply...					
	596	598	600	602-618	620	622
Request and are <b>permitted</b> to voluntarily use filtering-face-piece respirators, and are not exposed to a respiratory hazard		X				X
Request and are <b>permitted</b> to voluntarily use respirators that are <b>NOT</b> filtering-facepiece respirators, and are not exposed to a respiratory hazard	X	X			X	X
Are <b>required</b> to use any respirator by WISHA or the employer	X		X	X	X	X
Would use an <b>escape respirator</b> in an emergency	X		X	X	X	X

**Reference:** See WAC 296-307-100, Personal protective equipment (PPE) to find requirements for other types of personal protective equipment (PPE), such as eye, hand, and head protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-594, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-596 Respirator program administrator.**

**Your responsibility:**

To make sure a capable individual is in charge of respirator program development and management.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-596, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-59605 Designate a program administrator.**

**Exemption:** You do not need to designate a program administrator if employees use only filtering-facepiece respirators and do so only as voluntary use.

**Definition:**

Voluntary use is respirator use that is requested by the employee AND permitted by the employer when **NO** respiratory hazard exists.

**You must:**

- Designate a program administrator who has overall responsibility for your program and has sufficient training or experience to:

- Oversee program development and coordinate implementation

- Conduct required evaluations of program effectiveness outlined in WAC 296-307-60005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-59605, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-598 Voluntary respirator use requirements. Your responsibility:**

To make sure voluntary use of respirators by employees does not create job safety or health hazards.

- Interfere with an employee's ability to work safely,

[Title 296 WAC—p. 2580]

**You must:**

Make sure voluntary use of respirators is safe

WAC 296-307-59805

Keep voluntary use respirator program records

WAC 296-307-59810.

**IMPORTANT:**

- Respirator use is **NOT** voluntary if a respiratory hazard, such as exposure to a substance over the permissible exposure limit (PEL) or hazardous exposure to an airborne biological hazard, is present.

- To evaluate respiratory hazards in your workplace, see WAC 296-307-624, Respiratory hazards.

- Some requirements in this section do not apply if only filtering-facepiece respirators are used voluntarily. Some filtering-facepiece respirators are equipped with a sorbent layer for absorbing "nuisance" organic vapors. These can be used for voluntary use, but are not NIOSH certified for protection against hazardous concentrations of organic vapor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-598, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-59805 Make sure voluntary use of respirators is safe.**

**Definition:**

Voluntary use is respirator use that is requested by the employee AND permitted by the employer when **NO** respiratory hazard exists.

**IMPORTANT:** If you choose to require respirator use, use is **NOT** voluntary and the required use sections of this part apply.

**You must:**

(1) Make sure voluntary respirator use does **NOT**:

such as restricting necessary vision or radio communication

**OR**

- Create health hazards.

**Note:** Examples of health hazards include:

- Skin irritation, dermatitis, or other health effects caused by using a dirty respirator
- Illness created by sharing contaminated respirators
- Health effects caused by use of an unsafe air supply, such as carbon monoxide poisoning.

**You must:**

(2) Provide all voluntary respirator users with the advisory information in Table 2 at no cost to them.

**Note:** If you have provided employees with the advisory information required in the previous section, WAC 296-307-598, you do not need to provide the additional information in Table 2 to those employees.

**You must:**

(3) Develop and maintain a written program that includes the following:

- Medical evaluation provisions as specified in WAC 296-307-604.

- Procedures to properly clean and disinfect respirators, according to WAC 296-307-62015, if they are reused.
- How to properly store respirators, according to WAC 296-307-61010, so that using them does not create hazards.
- Procedures to make sure there is a safe air supply, according to WAC 296-307-616, when using air-line respirators and SCBAs.
- Training according to WAC 296-307-608 when necessary to ensure respirator use does NOT create a hazard.

**Note:**

- Pay for medical evaluations, training, travel related costs, and wages. You do NOT need to pay for respirators employees use only voluntarily.
- If you have both voluntary and required respirator users, you may choose to treat voluntary users as required users. Doing this exceeds the requirements in this section.

**Exemption:** If employees use only filtering-facepiece respirators and do so only voluntarily, you do not need to develop and maintain a written program.

Use Table 2 to provide information to employees who voluntarily use any type of respirator.

**Table 2**

<b>Advisory Information for Employees Who Voluntarily Use Respirators</b>
<ul style="list-style-type: none"> <li>• Respirators protect against airborne hazards when properly selected and used. WISHA recommends voluntary use of respirators when exposure to substances is below WISHA permissible exposure limits (PELs) because respirators can provide you an additional level of comfort and protection.</li> <li>• If you choose to voluntarily use a respirator (whether it is provided by you or your employer) be aware that <b>respirators can create hazards for you</b>, the user. You can avoid these hazards if you know how to use your respirator properly AND how to keep it clean. Take these steps:             <ul style="list-style-type: none"> <li>– Read and follow all instructions provided by the manufacturer about use, maintenance (cleaning and care), and warnings regarding the respirator's limitations.</li> <li>– Choose respirators that have been certified for use to protect against the substance of concern. The National Institute for Occupational Safety and Health (NIOSH) certifies respirators. If a respirator is not certified by NIOSH, you have no guarantee that it meets minimum design and performance standards for workplace use.                 <ul style="list-style-type: none"> <li>■ A NIOSH approval label will appear on or in the respirator packaging. It will tell you what protection the respirator provides.</li> </ul> </li> <li>– Keep track of your respirator so you do not mistakenly use someone else's.</li> <li>– <b>DO NOT</b> wear your respirator into:                 <ul style="list-style-type: none"> <li>■ Atmospheres containing hazards that your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against solvent vapor, smoke or oxygen deficiency.</li> <li>■ Situations where respirator use is required.</li> </ul> </li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-59805, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-59810 Keep voluntary use program records.**

**Exemption:** If employees use only filtering-facepiece respirators voluntarily, you do not need to follow these record-keeping requirements.

**You must:**

- Keep copies of:
  - Your current written respirator program
  - Written recommendations from the LHCP
- Allow records required by this section to be examined and copied by affected employees and their representatives.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-59810, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-600 Written respirator program and recordkeeping.**

**Your responsibility:**

(2007 Ed.)

To develop, implement, and maintain a written program that provides clear instruction for safe and reliable respirator use.

**You must:**

- Develop and maintain a written program
- WAC 296-307-60005
- Keep respirator program records
- WAC 296-307-60010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-600, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-60005 Develop and maintain a written program.**

**Exemption:** This section does NOT apply to respirator use that is voluntary. See WAC 296-307-59805 for voluntary use program requirements.

**You must:**

(1) Develop a complete worksite-specific written respiratory protection program that includes the applicable elements listed in Table 3.

**Note:** Pay for respirators, medical evaluations, fit testing, training, maintenance, travel costs, and wages.

**You must:**

(2) Keep your program current and effective by evaluating it and making corrections. Do ALL of the following:

- Make sure procedures and program specifications are followed and appropriate.
- Make sure selected respirators continue to be effective in protecting employees. For example:
  - If changes in work area conditions, level of employee exposure, or employee physical stress have occurred, you need to reevaluate your respirator selection.

- Have supervisors periodically monitor employee respirator use to make sure employees are using them properly.
  - Regularly ask employees required to use respirators about their views concerning program effectiveness and whether they have problems with:
    - Respirator fit during use
    - Any effects of respirator use on work performance
    - Respirators being appropriate for the hazards encountered
    - Proper use under current worksite conditions
    - Proper maintenance.
- When developing your written program include applicable elements listed in Table 3.

**Table 3**

<b>Required Elements for Required-Use Respirator Programs</b>	
• Selection:	<ul style="list-style-type: none"> <li>– Procedures for respirator selection</li> <li>– A list specifying the appropriate respirator for each respiratory hazard in your workplace</li> <li>– Procedures for issuing the proper type of respirator, if appropriate</li> </ul>
• Medical evaluation provisions	
• Fit-test provisions and procedures, if tight-fitting respirators are selected	
• Training provisions that address:	<ul style="list-style-type: none"> <li>– Respiratory hazards encountered during:                             <ul style="list-style-type: none"> <li>■ Routine activities</li> <li>■ Infrequent activities, for example, bimonthly cleaning of equipment</li> <li>■ Reasonably foreseeable emergencies, for example, rescue, spill response, or escape situations</li> </ul> </li> <li>– Proper use of respirators, for example, how to put on or remove respirators, and use limitations.</li> </ul>
<b>Note:</b>	You do NOT need to repeat training on respiratory hazards if employees have been trained on this in compliance with other rules such as WAC 296-307-550, employer chemical hazard communication.
• Respirator use procedures for:	<ul style="list-style-type: none"> <li>– Routine activities</li> <li>– Infrequent activities</li> <li>– Reasonably foreseeable emergencies</li> </ul>
• Maintenance:	<ul style="list-style-type: none"> <li>– Procedures and schedules for respirator maintenance covering:                             <ul style="list-style-type: none"> <li>■ Cleaning and disinfecting</li> <li>■ Storage</li> <li>■ Inspection and repair</li> <li>■ When to discard respirators</li> </ul> </li> <li>– A cartridge or canister change schedule <b>IF</b> air-purifying respirators are selected for use against gas or vapor contaminants <b>AND</b> an end-of-service-life-indicator (ESLI) is not available. In addition, provide:                             <ul style="list-style-type: none"> <li>■ The data and other information you relied on to calculate change schedule values (for example, highest contaminant concentration estimates, duration of employee respirator use, expected maximum humidity levels, user breathing rates, and safety factors)</li> </ul> </li> </ul>
• Procedures to ensure a safe air quantity and quality <b>IF</b> atmosphere-supplying respirators (air-line or SCBA) are selected	
• Procedures for evaluating program effectiveness on a regular basis	

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-60005, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-60010 Keep respirator program records.**

**You must:**

- Keep the following records:
  - Your current respirator program
  - Each employee's current fit test record, if fit testing is conducted. Fit test records must include:
    - Employee name
    - Test date

- Type of fit-test performed
- Description (type, manufacturer, model, style, and size) of the respirator tested
- Results of fit tests, for example, for quantitative fit tests include the overall fit factor **AND** a print out, or other recording of the test.
  - Training records that include employee's names and the dates trained

- Written recommendations from the LHCP.
- Allow records required by this section to be examined and copied by affected employees and their representatives.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-60010, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-602 Respirator selection.**

**Your responsibility:**

To select and provide respirators that are appropriate for the hazard, user, and worksite conditions.

**Exemption:** This section does NOT apply to voluntary respirator use. See WAC 296-307-598 of this part for voluntary use program requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-602, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-60205 Select and provide appropriate respirators.**

**IMPORTANT:**

See WAC 296-307-624, Respiratory hazards, for:

- Hazard evaluation requirements. Evaluation results are necessary for respirator selection.
- A list of substance-specific rules that may also apply to you. Those listed rules have additional respirator selection requirements.

**You must:**

- Select and provide, at no cost to employees, appropriate respirators for routine use, infrequent use, and reasonably foreseeable emergencies (such as escape, emergency, and spill response situations) by completing the following process:

**Respirator Selection Process**

**Step 1:** If your only respirator use is for escape, skip to **Step 8** to select appropriate respirators.

**Step 2:** If the respiratory hazard is a biological aerosol, such as TB (tuberculosis), anthrax, psittacosis (parrot fever), or hanta virus, select a respirator appropriate for **nonemergency** activities recognized to present a health risk to workers AND skip to **Step 8**.

- If respirator use will occur during **emergencies**, skip to **Step 8** and document the analysis used to select the appropriate respirator.

- Use Centers for Disease Control (CDC) selection guidance for exposures to specific biological agents when this guidance exists. Visit <http://www.cdc.gov>.

**Step 3:** If the respiratory hazard is a pesticide, follow the respirator specification on the pesticide label AND skip to **Step 9**.

**Step 4:** Determine the expected exposure concentration for each respiratory hazard of concern. Use the results from the evaluation required by WAC 296-307-624, Respiratory hazards.

**Step 5:** Determine if the respiratory hazard is classified as IDLH; if it is NOT IDLH skip to **Step 7**.

- The respiratory hazard IS classified as IDLH if:
  - The atmosphere is oxygen deficient or oxygen enriched

**OR**

- You CANNOT measure or estimate your expected exposure concentration

**OR**

(2007 Ed.)

- Your measured or estimated expected exposure concentration is greater or equal to the IDLH value in the NIOSH *Pocket Guide to Chemical Hazards*

**Note:** • WISHA uses the IDLH values in the 1990 edition of the NIOSH *Pocket Guide to Hazardous Chemicals* to determine the existence of IDLH conditions. You may use more recent editions of this guide. Visit [www.cdc.gov/niosh](http://www.cdc.gov/niosh) for more information.  
• If your measured or estimated expected exposure concentration is below NIOSH's IDLH values, proceed to **Step 7**.

**Step 6:** Select an appropriate respirator from one of the following respirators for IDLH conditions and skip to **Step 8**:  
• Full-facepiece, pressure demand, self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes

**OR**

- Full-facepiece, pressure demand air-line respirator equipped with an auxiliary self-contained air supply

**Exception:** If the respiratory hazard is oxygen deficiency AND you can show oxygen concentrations can be controlled within the ranges listed in Table 4 under ALL foreseeable conditions, you are allowed to select ANY type of SCBA or air-line respirator.

**Table 4  
Concentration Ranges for Oxygen Deficiency**

Altitude (as ft. above sea level)	Oxygen Concentration Range (as percent oxygen)
Below 3,001	16.0 - 19.5
3,001 - 4,000	16.4 - 19.5
4,001 - 5,000	17.1 - 19.5
5,001 - 6,000	17.8 - 19.5
6,001 - 8,000	19.3 - 19.5
Above 8,000 feet the exception does not apply.	

**Step 7:** Identify respirator types with assigned protection factors (APFs) from Table 5 that are appropriate to protect employees from the expected exposure concentration.

**Step 8:** Consider hazards that could require selection of specific respirator types. For example, select full-facepiece respirators to prevent eye irritation or abrasive blasting helmets to provide particle rebound protection.

**Step 9:** Evaluate user and workplace factors that might compromise respirator performance, reliability or safety.

- If the respiratory hazard is a pesticide, follow the requirements on the pesticide label and skip to **Step 11**.

**Examples:**

- High humidity or temperature extremes in the workplace.
- Necessary voice communication.
- High traffic areas and moving machinery.
- Time or distance for escape.

**Step 10:** Follow Table 6 requirements to select an air-purifying respirator.

- If Table 6 requirements cannot be met, you must select an air-line respirator or an SCBA.

**Step 11:** Make sure respirators you select are certified by the National Institute for Occupational Safety and Health (NIOSH).

- To maintain certification, make sure the respirator is used according to cautions and limitations specified on the NIOSH approval label.

**Note:** While selecting respirators, you will need to select a sufficient number of types, models or sizes to provide for fit test-

ing. You can also consider other respirator use issues, such as accommodating facial hair with a loose fitting respirator.

Use Table 5 to identify the assigned protection factor for different types of respirators.

**Table 5  
Assigned Protection Factors (APF) for Respirator Types**

If the respirator is a(n) . . .	Then the APF is . . .
Air-purifying respirator with a: • Half-facepiece . . . . . • Full-facepiece . . . . . <b>Note:</b> Half-facepiece includes 1/4 masks, filtering facepieces, and elastomeric facepieces.	10 100
Powered air-purifying respirator (PAPR) with a: • Loose-fitting facepiece . . . . . • Half-facepiece . . . . . • Full-facepiece, equipped with HEPA filters, chemical cartridges or canisters . . . . . • Hood or helmet, equipped with HEPA filters, chemical cartridges or canisters . . . . .	25 50 1000 1000
Air-line respirator with a: • Half-facepiece and designed to operate in demand mode . . . . . • Loose-fitting facepiece and designed to operate in continuous flow mode . . . . . • Half-facepiece and designed to operate in continuous-flow, or pressure-demand mode . . . . . • Full-facepiece and designed to operate in demand mode . . . . . • Full-facepiece and designed to operate in continuous-flow OR pressure-demand mode . . . . . • Helmet or hood and designed to operate in continuous-flow mode . . . . .	10 25 50 100 1000 1000
Self-contained breathing apparatus (SCBA) with a tight fitting: • Half-facepiece and designed to operate in demand mode . . . . . • Full-facepiece and designed to operate in demand mode . . . . . • Full-facepiece and designed to operate in pressure-demand mode . . . . . Combination respirators: • Find the APF for each type of respirator in the combination. • Use the lower APF to represent the combination.	10 100 10,000 The lowest value

Use Table 6 to select air-purifying respirators for particle, vapor, or gas contaminants.

**Table 6  
Requirements for Selecting Any Air-purifying Respirator**

If the contaminant is a . . .	Then . . .
• Gas OR vapor	• Provide a respirator with canisters or cartridges equipped with a NIOSH-certified, end-of-service-life indicator (ESLI) <b>OR</b> • If a canister or cartridge with an ESLI is NOT available, develop a cartridge change schedule to make sure the canisters or cartridges are replaced before they are no longer effective <b>OR</b> • Select an atmosphere-supplying respirator
• Particle, such as a dust, spray, mist, fog, fume, or aerosol	• Select respirators with filters certified to be at least 95% efficient by NIOSH – For example, N95s, R99s, P100s, or High Efficiency Particulate Air filters (HEPA) <b>OR</b> • You may select respirators NIOSH certified as "dust and mist," "dust, fume, or mist," OR "pesticides." You can only use these respirators if particles primarily have a mass median aerodynamic diameter of at least two micrometers. <b>Note:</b> These respirators are no longer sold for occupational use.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-60205, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-604 Medical evaluations.**

**Your responsibility:**

To make sure a respirator used under your specific work-site conditions is not a health risk to employees.

- Exemption:** This section does NOT apply to employees who only use:  
• Filtering-facepiece respirators voluntarily. See WAC 296-307-598 of this part for voluntary use requirements  
**OR**  
• Escape-only respirators that are mouthpiece, loose-fitting, or hooded respirators.

**IMPORTANT:**

- Using a respirator can create physical risks for an employee each time it is worn. The extent of these risks depends on these factors:
  - Type of respirator
  - Environmental conditions at the worksite
  - Physical demands of the work

- Use of other protective clothing
- Employee's health status.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-604, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-60405 Provide medical evaluations.**

**IMPORTANT:**

If you have provided an employee with a medical evaluation addressing respirator use, as required by another chapter, that evaluation will meet the requirements of this section.

**You must:**

- Follow the medical evaluation process, Steps 1 through 7 in this section, to provide medical evaluations for employees at no cost to them.

**Medical Evaluation Process**

**Step 1:** Identify employees who need medical evaluations AND determine the frequency of evaluations from Table 7. Include employees who:

- Are required to use respirators

**OR**

- Voluntarily use respirators that are **not** filtering-face-piece respirators

**Note:** You may use a previous employer's medical evaluation for an employee if you can:

- Show the employee's previous work and use conditions were substantially similar to yours
- AND**
- Obtain a copy of the licensed healthcare professional's (LHCP's) written recommendation approving the employee's use of the respirator chosen by you.

**Step 2:** Identify a licensed healthcare professional (LHCP) to perform your medical evaluations.

**Note:** If you select a different LHCP, you do not need to have new medical evaluations done.

**Step 3:** Make sure your LHCP has the following information **before** the evaluation is completed:

- Information describing the respirators employees may use, including the weight and type.
- How the respirators will be used, including:
  - How often the respirator will be used, for example, daily, or once a month
  - The duration of respirator use, for example, a minimum of one hour, or up to twelve hours
  - The employee's expected physical work effort
  - Additional personal protective clothing and equipment to be worn
  - Temperature and humidity extremes expected during use
- A copy of your written respiratory protection program **and** this part.

**Note:**

- You may choose to send the questionnaire to the LHCP ahead of time, giving time to review it and add any necessary questions
- The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

**Step 4:** Administer the medical questionnaire in WAC 296-307-61605 to employees, OR provide them a medical exam that obtains the same information.

**Note:** You may use on-line questionnaires if the questions are the same and requirements of this section are met.

- Administer the examination or questionnaire at no cost to employees:

- During the employee's normal working hours

**OR**

- At a time and place convenient to the employee

- Maintain employee confidentiality during examination or questionnaire administration:

- Do **not** view employee's answers on the questionnaire
- Do **not** act in a manner that may be considered a breach of confidentiality

**Note:** Providing confidentiality is important for securing successful medical evaluations. It helps make sure the LHCP gets complete and dependable answers on the questionnaire.

- Make sure employees understand the content of the questionnaire.

- Provide the employee with an opportunity to discuss the questionnaire or exam results with the LHCP.

**Step 5:** Provide follow-up evaluation for employees when:

- The LHCP needs more information to make a final recommendation

**OR**

- An employee gives any positive response to questions 1-8 in Part 2 OR to questions 1-6 in Part 3 of the WISHA medical evaluation questionnaire in WAC 296-307-61605.

**Note:** Follow-up may include:

- Employee consultation with the LHCP such as a telephone conversation to evaluate positive questionnaire responses
- Medical exams
- Medical tests or other diagnostic procedures.

**Step 6:** Obtain a written recommendation from the LHCP that contains only the following medical information:

- Whether or not the employee is medically able to use the respirator
- Any limitations of respirator use for the employee
- What future medical evaluations, if any, are needed
- A statement that the employee has been provided a copy of the written recommendation.

**Step 7:** Provide a powered, air-purifying respirator (PAPR) when the LHCP determines the employee should not wear a negative-pressure air-purifying respirator **AND** is able to wear a PAPR.

**Reference:** See WAC 296-307-602 for requirements regarding selection of air-purifying respirators.

**Note:**

- You may discontinue medical evaluations for an employee when the employee no longer uses a respirator.
- If you have staff conducting your medical evaluations, they may keep completed questionnaires and findings as confidential medical records, if they are maintained separately from other records.

Use Table 7 to determine medical evaluation frequency.

**Table 7  
Evaluation Frequency**

Type of Evaluation:	When required:
Initial medical evaluations	• Before respirators are fit-tested or used in the workplace.
Subsequent medical evaluations	• If any of these occur:

Type of Evaluation:	When required:
	<ul style="list-style-type: none"> <li>– Your licensed healthcare professional (LHCP) recommends them; for example, periodic evaluations at specified intervals.</li> <li>– A respirator program administrator or supervisor informs you that an employee needs reevaluation.</li> <li>– Medical signs or symptoms (such as breathing difficulties) are: <ul style="list-style-type: none"> <li>■ Observed during fit-testing or program evaluation</li> </ul> </li> <li style="text-align: center;"><b>OR</b></li> <li>■ Reported by the employee</li> <li>– Changes in worksite conditions such as physical work effort, personal protective clothing, or temperature that could substantially increase the employee's physiological stress.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-60405, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-606 Fit testing.

#### Your responsibility:

To make sure negative and positive-pressure tight-fitting respirators can provide an adequate fit and acceptable level of comfort to employees.

**Exemption:** This section does **NOT** apply to any respirators that are:

- Voluntarily used. See WAC 296-307-598 for voluntary use requirements.
- Mouthpiece respirators.

#### IMPORTANT:

- Fit testing is an activity where the seal of a respirator is tested to determine if it is adequate.
- This section covers general **requirements** for fit testing. Fit-testing **procedures** are covered in WAC 296-307-62010 of this part.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-606, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-60605 Conduct fit testing.

#### You must:

- Provide, at no cost to the employee, fit tests for ALL tight fitting respirators on the following schedule:
  - Before employees are assigned duties that may require the use of respirators
  - At least every twelve months after initial testing
  - Whenever any of the following occurs:
    - A different respirator facepiece is chosen such as a different type, model, style, or size
    - You become aware of a physical change in an employee that could affect respirator fit. For example, you may observe, or be told about, facial scarring, dental changes, cosmetic surgery, or obvious weight changes
    - An employee notifies you, or your LHCP, that the respirator fit is unacceptable. During the retest, you must give an employee reasonable opportunity to select a different respirator facepiece (size, model, etc.).

**Note:** You may accept a fit test completed by a previous employer **IF:**

- You obtain written documentation of the fit test

**AND**

- The results of the fit test are not more than twelve months old

**AND**

- The employee will use the same respirator (the same type, model, style, and size)

**AND**

- The fit test was conducted in a way that meets the requirements of WAC 296-307-606 and 296-307-62010.

#### You must:

- Select an appropriate fit-testing procedure from WAC 296-307-62010 of this part **AND:**
  - Use quantitative fit-test methods when a negative pressure respirator will be used in concentrations requiring a protection factor greater than 10. This includes:
    - Full facepiece air-purifying respirators
    - SCBAs operated in demand (negative pressure) mode
    - Air-line respirators operated in demand mode.
  - Make sure PAPRs, SCBAs, or air-line respirators are fit tested in negative-pressure mode.
- Make sure the person conducting fit testing is able to do ALL of the following:
  - Prepare test solutions if required
  - Make sure equipment works properly
  - Perform tests properly
  - Recognize invalid tests
  - Calculate fit factors properly if required.

**Note:**

- No specific training program or certification is required for those who conduct fit tests.
- You should consider evaluating these individuals to determine their proficiency in the fit-testing method to be used.
- You can use an evaluation form such as the form included in the American National Standard for Respirator Fit Testing Methods, ANSI/AIHA Z88.10-2001 to determine if the individual meets these requirements. Visit [www.ansi.org](http://www.ansi.org) or [www.aiha.org](http://www.aiha.org).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-60605, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-608 Training.

#### Your responsibility:

To make sure employees who are required to use respirators understand and can demonstrate proper respirator use and maintenance.

#### IMPORTANT:

This section applies to employees who voluntarily use respirators only when training is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-608, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-60805 Provide effective training.

#### You must:

- Train employees, based on their duties, if they do any of the following:
  - Use respirators

- Supervise respirator users
- Issue, repair, or adjust respirators
- Present effective training in a way that employees understand.

**Note:**

- Training may be provided using audiovisuals, slide presentations, formal classroom instruction, informal discussions during safety meetings, training programs conducted by outside sources, or a combination of these methods.
- You may want to have instructors available when using video or automated training methods to:
  - Encourage and provide responses to questions for the benefit of employees
  - Evaluate employees' understanding of the material
  - Provide other instructional interaction to employees.

**You must:**

- Make sure a qualified instructor provides training
  - Provide training, at no cost to the employee, at these times:
    - Initially, before worksite respirator use begins
    - Periodically, within twelve months of the previous training
    - Additionally, when the following occur:
      - The employee has not retained knowledge or skills
- OR**
- Changes in the worksite, or type of respirator make previous training incomplete or obsolete.

**Note:**

- You may accept an employee's previous training, such as training provided by another employer, to satisfy the initial training requirement if:
  - You can demonstrate the employee received training within the past twelve months

**AND**

- The employee can demonstrate the knowledge and skills to use required respirators effectively.
- If you accept an employee's previous training to satisfy the initial training requirement, you are still responsible for providing periodic, and additional training when needed. Periodic training would need to be provided within twelve months of the employee's previous training.

**You must:**

- Make sure employees can demonstrate the following knowledge and skills as required by their duties:
  - Why the respirator is necessary. Include, for example, information identifying respiratory hazards such as hazardous chemicals, the extent of the employee's exposure, and potential health effects and symptoms
  - The respirator's capabilities and limitations. Include, for example, how the respirator provides protection and why air-purifying respirators cannot be used in oxygen-deficient conditions
    - How improper fit, use, or maintenance can compromise the respirator's effectiveness and reliability
    - How to properly inspect, put on, seal check, use, and remove the respirator
    - How to clean, disinfect, repair, and store the respirator, or how to get this done by someone else
    - How to use the respirator effectively in emergency situations; including what to do when a respirator fails and where emergency respirators are stored
    - Medical signs and symptoms that may limit or prevent the effective use of respirators such as shortness of breath or dizziness
    - The employer's general obligations under this part. For example, developing a written program, selecting appropriate respirators, and providing medical evaluations.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-60805, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-610 Maintenance.**

**Your responsibility:**

To make sure respirators are maintained so they will function properly and not create health hazards such as skin irritation.

**You must:**

- Maintain respirators in a clean and reliable condition  
WAC 296-307-61005
- Store respirators properly  
WAC 296-307-61010
- Inspect and repair respirators  
WAC 296-307-61015

**IMPORTANT:**

This section applies to employees who voluntarily use respirators only when maintenance is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-610, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-61005 Maintain respirators in a clean and reliable condition.**

**You must:**

- Make sure respirators are kept, at no cost to the employee, clean, sanitary and in good working order. Do at least the following:
  - Clean and disinfect respirators as often as specified in Table 8 of this section.

**Note:**

- Use required cleaning and disinfecting procedures in WAC 296-307-62015, **or** the manufacturer's procedures that:
  - Result in a clean and sanitary respirator
  - Do not damage the respirator
  - Do not harm the user
  - Automated cleaning and disinfecting are permitted
  - Cleaning and disinfecting may be done by a central facility as long as you make sure respirators provided are clean, sanitary, and function properly.

**You must:**

- Make sure respirators are assembled properly after cleaning or disinfecting.
- Use Table 8 to determine how often to clean and disinfect respirators.

**Table 8  
Required Frequencies for Cleaning  
and Disinfecting Respirators**

<b>If, the respirator will be . . .</b>	<b>Then, clean and disinfect the respirator . . .</b>
<ul style="list-style-type: none"> <li>• <b>Used exclusively</b> by one employee</li> </ul>	<ul style="list-style-type: none"> <li>• As often as needed to:                             <ul style="list-style-type: none"> <li>- Keep it clean and functional</li> </ul> </li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>- To prevent health hazards such as skin irritation</li> </ul>
<ul style="list-style-type: none"> <li>• Shared for nonemergency use</li> </ul> <p><b>OR</b></p>	<ul style="list-style-type: none"> <li>• <b>Before</b> it is worn by another employee</li> </ul>

[Title 296 WAC—p. 2587]

<b>If, the respirator will be . . .</b>	<b>Then, clean and disinfect the respirator . . .</b>
• Used for fit-testing or training	
• Shared for emergency use	• <b>After</b> each use so the respirator is immediately ready for use at all times

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61005, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-61010 Store respirators properly.**

**You must:**

- Store respirators to protect them from ALL of the following:
  - Deformation of the facepiece or exhalation valve
  - Sunlight or extreme temperatures or other conditions
  - Contamination such as dust or damaging chemicals
  - Excessive moisture.

**Note:** Use coffee cans, sealable plastic bags, or other suitable means of protection.

**You must:**

- Follow these additional requirements for emergency respirators:
  - Keep respirators accessible to the work area
  - Store respirators in compartments or with covers clearly marked as containing emergency respirators
  - Follow additional storage instructions from the respirator manufacturer
  - Store an adequate number of emergency respirators in each area where they may be needed.

**Note:** Emergency respirators include mouthpiece respirators and other respirators that are limited to escape-only use by their NIOSH certification.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61010, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-61015 Inspect and repair respirators.**

**You must:**

- Conduct respirator inspections as often as specified in Table 9.
- Make sure respirator inspections cover **all** of the following:
  - Respirator function
  - Tightness of connections
  - The condition of the facepiece, head straps, valves, connecting tubes, and cartridge, canisters or filters
  - Pliability and deterioration of elastomeric parts
  - Maintenance of air or oxygen cylinders
  - Making sure SCBA air cylinders are at ninety percent of the manufacturer's recommended pressure level
  - Proper functioning of SCBA regulators when air-flow is activated
  - Proper functioning of SCBA low-pressure warning devices when activated
  - Certify inspections for emergency respirators by documenting the following:
    - Inspection date
    - Serial number of each respirator or other identifying information
    - Inspector's name or signature
    - Inspection findings

[Title 296 WAC—p. 2588]

– Required action, if problems are found.

**Note:**

- When documenting inspections you may either:
  - Provide the information on a tag or label and attach it to the respirator compartment
- OR**
- Include the information in an inspection report stored in paper or electronic files accessible to employees.

**You must:**

- Repair or replace any respirator that is not functioning properly **before** the employee returns to a situation where respirators are required.
  - If respirators fail inspection or are not functioning properly during use due to problems such as leakage, vapor or gas breakthrough, or increased breathing resistance, **ALL** of the following apply:
    - **Do NOT** permit such respirators to be used until properly repaired or adjusted
    - Use only NIOSH-certified parts
    - Make sure repairs and adjustments are made by appropriately trained individuals
      - Use the manufacturer or a technician trained by the manufacturer to repair or adjust reducing and admission valves, regulators, and warning devices on SCBAs or air-line respirators.
    - Follow the manufacturer's recommendations and specifications for the type and extent of repairs.
- Use Table 9 to determine how often to inspect respirators.

**Table 9**

**Required Frequencies for Respirator Inspections**

<b>If the respirator is . . .</b>	<b>Then inspect . . .</b>
A SCBA in any use	• Before <b>each</b> use <b>AND</b> • During cleaning <b>OR</b> • Monthly if <b>NOT</b> used
Used for nonemergencies, including day-to-day or infrequent use	• Inspect before each use  <b>AND</b>  • During cleaning
Used only for emergencies	• Check for proper function before <b>and</b> after <b>each</b> use <b>AND</b> • Inspect at least monthly as instructed by the manufacturer
Used for escape-only purposes	• Before carrying into a work place for use

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61015, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-612 Safe use and removal of respirators.**

**Your responsibility:**

To make sure respirator use and removal is safe.

**Exemption:** These sections do **NOT** apply to employees who voluntarily use any type of respirator. See WAC 296-307-598 for voluntary use requirements.

**You must:**

Prevent sealing problems with tight-fitting respirators  
WAC 296-307-61205

Make sure employees leave the use area before removing respirators

WAC 296-307-61210.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-612, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-61205 Prevent sealing problems with tight-fitting respirators.

#### You must:

- Make sure employees use the procedure in WAC 296-307-62020 to perform a user seal check each time they put on their tight-fitting respirator.
- Make sure you do NOT permit respirator use if employees have a characteristic that interferes with the respirator facepiece seal or valve function. For example, stubble, moustaches, sideburns, bangs, hairlines, or scars between the face and the sealing surface of the respirator will affect the seal.
- Make sure corrective glasses or personal protective equipment (PPE) do NOT interfere with the facepiece seal. Examples of PPE include safety glasses, goggles, face-shields, clothing, and hard hats.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61205, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-61210 Make sure employees leave the use area before removing respirators.

#### You must:

- Make sure employees leave the use area for any of these reasons:
  - To replace air-purifying filters, cartridges, or canisters
  - When they smell or taste (detect) vapor or gas leakage from, for example, cartridges, canister, or the facepiece seal
  - When they detect changes in breathing resistance
  - To readjust their respirators
  - To wash their faces and respirators as necessary to prevent skin or eye irritation
    - If they become ill
    - If they experience sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, or chills.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61210, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-614 Standby requirements for immediately dangerous to life or health (IDLH) conditions.

#### Your responsibility:

To provide adequate assistance to employees using respirators in conditions immediately dangerous to life or health (IDLH).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-614, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-61405 Provide standby assistance in immediately dangerous to life or health (IDLH) conditions.

#### IMPORTANT:

WISHA currently uses the IDLH values in the 1990 NIOSH *Pocket Guide to Chemical Hazards* to determine the existence of IDLH conditions. You may use more recent edi-  
(2007 Ed.)

tions of this guide. Visit [www.cdc.gov/niosh](http://www.cdc.gov/niosh) for more information.

#### You must:

- Provide at least two standby employees outside the IDLH area.

**Note:** You need only one standby employee if the IDLH condition is well characterized, will remain stable AND you can show one employee can adequately do ALL of the following:

- Monitor employees in the IDLH area
- Implement communication
- Initiate rescue duties.
- Train and equip standby employees to provide effective emergency rescue. Equip them with:
  - A pressure-demand SCBA or a pressure-demand air-line respirator with an auxiliary SCBA, for each standby employee
  - Appropriate retrieval equipment, when it would help with the effective rescue of the entrant, or an equivalent means of rescue
    - Make sure standby employees maintain visual, voice, or signal line communication with employees in the IDLH area
    - Make sure that in the event of an emergency:
      - Standby employees notify you or your designee before they enter the IDLH area to provide emergency rescue
      - You provide necessary assistance when notified.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61405, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-616 Air quality for self-contained breathing apparatus (SCBA) and air-line respirators.

#### Your responsibility:

To provide employees who use SCBAs or air-line respirators with an acceptable air supply.

#### You must:

- Make sure breathing air and oxygen meet established specifications
- WAC 296-307-61605
- Prevent conditions that could create a hazardous breathing air supply
- WAC 296-307-61610
- Make sure compressors do not create a hazardous breathing air supply
- WAC 296-307-61615.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-616, filed 12/21/04, effective 4/2/05.]

### WAC 296-307-61605 Make sure breathing air and oxygen meet established specifications.

#### You must:

- Make sure that all SCBAs and air-line respirators are provided with safe breathing air and oxygen according to the following:
  - Compressed breathing air must meet the following specifications for Grade D air:
    - Oxygen (volume/volume) within 19.5-23.5%
    - Hydrocarbon (condensed): NO MORE than five milligrams per cubic meter of air
    - Carbon monoxide (CO): NO MORE than ten parts per million (ppm)
    - Carbon dioxide (CO<sub>2</sub>): NO MORE than 1,000 ppm
    - No noticeable odor

**Reference:** See the American National Standards Institute - Compressed Gas Association Commodity Specification for Air (G-7.1.1989) for more information. Contact your local library to access a copy.

**You must:**

- Make sure the moisture content of the air supplied meets the following:
  - Air supplied to respirators from cylinders must **NOT** exceed a dew point of -50°F (or -45.6°C) at 1 atmospheric pressure.
  - Compressor supplied air must **NOT** exceed a dew point of 10°F (or 5.56°C) **BELOW** the use temperature at 1 atmospheric pressure.
- Cylinders obtained from a supplier of breathing air must have a certificate of analysis that verifies each cylinder's contents meet Grade D and dew point standards.
- Compressed and liquid oxygen must meet the United States Pharmacopoeia requirements for medical or breathing oxygen.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61605, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-61610 Prevent conditions that could create a hazardous breathing air supply.**

**You must:**

- Use SCBA and air-line respirators safely:
  - Do **NOT** supply compressed oxygen to SCBAs or air-line respirators that previously used compressed air.

**Note:** Compressed air leaves residues containing hydrocarbons such as oil or grease. Fire or explosion can occur if compressed oxygen makes contact with these residues.

**You must:**

- Use breathing air couplings on air-line respirators that are **NOT** compatible with couplings for nonrespirable air or other gas systems, for example, utility air used for manufacturing purposes.
- Do **NOT** allow asphyxiating substances to enter breathing air lines; for example, do not flush nitrogen through worksite air lines also used for breathing air.
- Use equipment specifically designed for oxygen service or distribution **IF** oxygen concentrations greater than 23.5% are used.

**Note:** Respiratory equipment **NOT** designed for oxygen service or distribution can create fire or explosion hazards in oxygen concentrations higher than 23.5%.

**You must:**

- Make sure cylinders used to supply breathing air for SCBAs or air-line respirators are tested and maintained as described in the federal Department of Transportation's (DOT) Shipping Container Specification Regulations, Title 49 CFR Parts 173 and 178.

**Note:**

- Use only cylinders marked (with serial number, cylinder pressure, DOT exemption number, and test dates) according to these DOT regulations
- To find any Code of Federal Regulations (CFR) visit: [www.access.gpo.gov](http://www.access.gpo.gov).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61610, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-61615 Make sure compressors do not create a hazardous breathing air supply.**

**IMPORTANT:**

[Title 296 WAC—p. 2590]

- Ambient-air movers (or pumps) used to supply air to respirators must be used according to the manufacturer's instructions.

- Respirators used with ambient-air movers must be approved by NIOSH to operate within the pressure ranges of the air mover.

**You must:**

- (1) Locate or modify compressor intakes so they will not pick up contaminated air OR exhaust gases such as carbon monoxide from:
  - Fuel-powered vehicles

**OR**

- The internal combustion motor of the compressor

**OR**

- Other contaminant sources in the area, for example, a ventilation system discharge.

**Note:**

- You may need to reposition or extend the compressor's intake or engine exhaust pipe or outlet, especially if they are located near each other.
  - Be aware that exhaust gases may not adequately disperse when the compressor is operated in:
    - An enclosed space such as a small room, a corner, or near a wall
- OR**
- In turbulent wind conditions.

**You must:**

- (2) Equip compressors with suitable air-purifying filters, water traps, and sorbents (such as charcoal beds) and maintain them as follows:
  - Periodically change or clean them according to the manufacturer or supplier's instructions
  - Keep a tag at the compressor with the following information:
    - When the sorbent and filters were last replaced or cleaned
    - The date of the most recent changes or cleaning
    - The signature of the person authorized by the employer to perform changes or cleaning.

**Note:** To be sure you are providing the recommended operating pressure for respirators, you may need to install a delivery pressure gauge at the point where the manifold respirator hose is attached.

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**You must:**

- (3) Make sure the carbon monoxide (CO) level in breathing air from compressors does **NOT** exceed ten parts per million (ppm).

**Note:** If you do not have a reliable CO-free area available for locating your compressor intake, consider these examples of methods to prevent CO contamination of the air supply:

- Use of continuous and effective carbon monoxide alarms and filters
- Conduct frequent monitoring of air quality
- Use a CO converter (converts CO to carbon dioxide).

**You must:**

- Maintain CO levels in oil lubricated compressors by using at least one of the following:
  - An effective CO alarm

- An effective high temperature alarm **AND** testing the air supply often enough to see if CO levels exceed ten ppm.

**Note:**

- How often to test depends on a number of considerations, for example:
  - Compressor age
  - Maintenance history of the compressor
  - Stability of CO readings
- If the CO or high temperature alarm cannot be heard by the employee, a flashing light or other effective alternative to an audio alarm needs to be used

- Safeguards, such as alarms, are necessary to prevent CO contamination resulting from compressor overheating
- Any type of oil-lubricated compressor, such as screw or piston types, may produce dangerous levels of CO if overheating occurs
  - Old compressors are known to leak oil due to worn parts, increasing the possibility for overheating. Newer compressors may also overheat if maintenance practices are poor. For example, poor maintenance practices may lead to disconnected or incorrectly set alarms, inoperative shut-offs, or an impaired cooling system
- You need to instruct employees to move to a safe area when the alarm sounds AND to stop using respirators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61615, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-618 Labeling of air-purifying respirator filters, cartridges, and canisters.**

**Your responsibility:**

To make sure employees, their supervisors, and program administrators can easily check for the correct air-purifying filters, cartridges, and canisters on respirators.

**Exemption:** This section does NOT apply to filtering-facepiece respirators when used voluntarily. See WAC 296-307-598 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-618, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-61805 Keep labels readable on respirator filters, cartridges, and canisters during use.**

**You must:**

- Make sure the NIOSH certification labeling and color-coding on air-purifying respirator filters, cartridges, and canisters remains readable and intact during use.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-61805, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-620 Required procedures for respiratory protection program.**

**Your responsibility:**

To use the procedures and questionnaire provided in this section when implementing your respiratory protection program.

**You must:**

- Use this medical questionnaire for medical evaluations WAC 296-307-62005
- Follow these fit-testing procedures for tight-fitting respirators WAC 296-307-62010
- Follow procedures established for cleaning and disinfecting respirators WAC 296-307-62015
- Follow procedures established for seal checking respirators

WAC 296-307-62020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-620, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62005 Use this medical questionnaire for medical evaluations.**

**You must:**

- Use the medical questionnaire in Table 10 when conducting medical evaluations.

- Note:**
- You may use a physical exam instead of this questionnaire if the exam covers the same information as the questionnaire.
  - You may use on-line questionnaires if the questions are the same and the requirements in WAC 296-307-604 of this part are met.
  - You may choose to send the questionnaire to the LCHP ahead of time, giving time to review it and add any necessary questions.
  - The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

**Table 10**

<b>WISHA Medical Evaluation Questionnaire</b>	
<b>Employer instructions:</b>	
<ul style="list-style-type: none"> <li>• You may use on-line questionnaires if the requirements in WAC 296-307-60405 are met.</li> <li>• You must tell your employee how to deliver or send the completed questionnaire to the healthcare provider you have selected.</li> <li>• You must NOT review employees' questionnaires.</li> </ul>	
<b>Healthcare provider's instructions:</b>	
<ul style="list-style-type: none"> <li>• Review the information in this questionnaire and any additional information provided to you by the employer.</li> <li>• You may add questions to this questionnaire at your discretion; HOWEVER, questions in Parts 1-3 may not be deleted or substantially altered.</li> <li>• Follow-up evaluation is required for any positive response to questions 1-8 in Part 2, or questions 1-6 in Part 3. This might include: Phone consultations to evaluate positive responses, medical tests, and diagnostic procedures.</li> <li>• When your evaluation is complete, send a copy of your written recommendation to the employer AND employee.</li> </ul>	
<b>Employee information and instructions:</b>	
<ul style="list-style-type: none"> <li>• Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that's convenient to you.</li> <li>• Your employer or supervisor must not look at or review your answers at any time.</li> </ul>	

**Part 1 - Employee Background Information**

**ALL employees must complete this part**

**Please print**

1. Today's date: \_\_\_\_\_
2. Your name: \_\_\_\_\_
3. Your age (to nearest year): \_\_\_\_
4. Sex (circle one): Male / Female
5. Your height: \_\_\_\_ft. \_\_\_\_in.
6. Your weight: \_\_\_\_lbs.
7. Your job title: \_\_\_\_\_

8. A phone number where you can be reached by the healthcare professional who reviews this questionnaire (include Area Code): _____			
9. The best time to call you at this number: _____			
10. Has your employer told you how to contact the healthcare professional who will review this questionnaire?	Yes	/	No
11. Check the type of respirator(s) you will be using:			
a. ___ N, R, or P filtering-facepiece respirator (for example, a dust mask, OR an N95 filtering-facepiece respirator).			
b. Check all that apply.			
<input type="checkbox"/> Half mask <input type="checkbox"/> Full facepiece mask <input type="checkbox"/> Helmet hood <input type="checkbox"/> Escape			
<input type="checkbox"/> Nonpowered cartridge or canister <input type="checkbox"/> Powered air-purifying cartridge respirator (PAPR)			
<input type="checkbox"/> Supplied-air or Air-line			
Self-contained breathing apparatus (SCBA): <input type="checkbox"/> Demand or <input type="checkbox"/> Pressure demand			
Other: _____			
12. Have you previously worn a respirator?	Yes	/	No
If "yes," describe what type(s): _____			
<b>Part 2 - General Health Information</b>			
<b>ALL employees must complete this part</b>			
<b>Please circle "Yes" or "No"</b>			
1. Do you <i>currently</i> smoke tobacco, or have you smoked tobacco in the last month?	Yes	/	No
2. Have you <i>ever had</i> any of the following conditions?			
a. Seizures (fits):	Yes	/	No
b. Diabetes (sugar disease):	Yes	/	No
c. Allergic reactions that interfere with your breathing:	Yes	/	No
d. Claustrophobia (fear of closed-in places):	Yes	/	No
e. Trouble smelling odors:	Yes	/	No
3. Have you <i>ever had</i> any of the following pulmonary or lung problems?			
a. Asbestosis:	Yes	/	No
b. Asthma:	Yes	/	No
c. Chronic bronchitis:	Yes	/	No
d. Emphysema:	Yes	/	No
e. Pneumonia:	Yes	/	No
f. Tuberculosis:	Yes	/	No
g. Silicosis:	Yes	/	No
h. Pneumothorax (collapsed lung):	Yes	/	No
i. Lung cancer:	Yes	/	No
j. Broken ribs:	Yes	/	No
k. Any chest injuries or surgeries:	Yes	/	No
l. Any other lung problem that you have been told about:	Yes	/	No
4. Do you <i>currently</i> have any of the following symptoms of pulmonary or lung illness?			
a. Shortness of breath:	Yes	/	No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline:	Yes	/	No
c. Shortness of breath when walking with other people at an ordinary pace on level ground:	Yes	/	No
d. Have to stop for breath when walking at your own pace on level ground:	Yes	/	No
e. Shortness of breath when washing or dressing yourself:	Yes	/	No
f. Shortness of breath that interferes with your job:	Yes	/	No
g. Coughing that produces phlegm (thick sputum):	Yes	/	No
h. Coughing that wakes you early in the morning:	Yes	/	No
i. Coughing that occurs mostly when you are lying down:	Yes	/	No
j. Coughing up blood in the last month:	Yes	/	No
k. Wheezing:	Yes	/	No
l. Wheezing that interferes with your job:	Yes	/	No
m. Chest pain when you breathe deeply:	Yes	/	No
n. Any other symptoms that you think may be related to lung problems:	Yes	/	No
5. Have you <i>ever had</i> any of the following cardiovascular or heart problems?	Yes	/	No
a. Heart attack:	Yes	/	No
b. Stroke:	Yes	/	No
c. Angina:	Yes	/	No
d. Heart failure:	Yes	/	No
e. Swelling in your legs or feet (not caused by walking):	Yes	/	No
f. Heart arrhythmia (heart beating irregularly):	Yes	/	No
g. High blood pressure:	Yes	/	No

h. Any other heart problem that you have been told about:	Yes	/	No
6. Have you <i>ever had</i> any of the following cardiovascular or heart symptoms?			
a. Frequent pain or tightness in your chest:	Yes	/	No
b. Pain or tightness in your chest during physical activity:	Yes	/	No
c. Pain or tightness in your chest that interferes with your job:	Yes	/	No
d. In the past 2 years, have you noticed your heart skipping or missing a beat:	Yes	/	No
e. Heartburn or indigestion that's not related to eating:	Yes	/	No
f. Any other symptoms that you think may be related to heart or circulation problems:	Yes	/	No
7. Do you <i>currently</i> take medication for any of the following problems?	Yes	/	No
a. Breathing or lung problems:	Yes	/	No
b. Heart trouble:	Yes	/	No
c. Blood pressure:	Yes	/	No
d. Seizures (fits):	Yes	/	No
8. If you have used a respirator, have you <i>ever had</i> any of the following problems? (If you have never used a respirator, check the following space and go to question 9): ____			
a. Eye irritation:	Yes	/	No
b. Skin allergies or rashes:	Yes	/	No
c. Anxiety:	Yes	/	No
d. General weakness or fatigue:	Yes	/	No
e. Any other problem that interferes with your use of a respirator?	Yes	/	No
9. Would you like to talk to the healthcare professional who will review this questionnaire about your answers?	Yes	/	No

**Part 3 - Additional Questions for Users of Full-Facepiece Respirators or SCBAs**

Please circle "Yes" or "No"

1. Have you <i>ever lost</i> vision in either eye (temporarily or permanently)?	Yes	/	No
2. Do you <i>currently</i> have any of these vision problems?			
a. Need to wear contact lenses:	Yes	/	No
b. Need to wear glasses:	Yes	/	No
c. Color blindness:	Yes	/	No
d. Any other eye or vision problem:	Yes	/	No
3. Have you <i>ever had</i> an injury to your ears, including a broken ear drum?	Yes	/	No
4. Do you <i>currently</i> have any of these hearing problems?			
a. Difficulty hearing:	Yes	/	No
b. Need to wear a hearing aid:	Yes	/	No
c. Any other hearing or ear problem:	Yes	/	No
5. Have you <i>ever had</i> a back injury?	Yes	/	No
6. Do you <i>currently</i> have any of the following musculoskeletal problems?			
a. Weakness in any of your arms, hands, legs, or feet:	Yes	/	No
b. Back pain:	Yes	/	No
c. Difficulty fully moving your arms and legs:	Yes	/	No
d. Pain or stiffness when you lean forward or backward at the waist:	Yes	/	No
e. Difficulty fully moving your head up or down:	Yes	/	No
f. Difficulty fully moving your head side to side:	Yes	/	No
g. Difficulty bending at your knees:	Yes	/	No
h. Difficulty squatting to the ground:	Yes	/	No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes	/	No
j. Any other muscle or skeletal problem that interferes with using a respirator:	Yes	/	No

**Part 4 - Discretionary Questions**

Complete questions in this part ONLY IF your employer's healthcare provider says they are necessary

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen?	Yes	/	No
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these conditions:	Yes	/	No
2. Have you ever been exposed (at work or home) to hazardous solvents, hazardous airborne chemicals (such as gases, fumes, or dust), OR have you come into skin contact with hazardous chemicals? If "yes," name the chemicals, if you know them: _____	Yes	/	No
3. Have you ever worked with any of the materials, or under any of the conditions, listed below:			
a. Asbestos?	Yes	/	No
b. Silica (for example, in sandblasting)?	Yes	/	No
c. Tungsten/cobalt (for example, grinding or welding this material)?	Yes	/	No
d. Beryllium?	Yes	/	No

e. Aluminum?	Yes	/	No
f. Coal (for example, mining)?	Yes	/	No
g. Iron?	Yes	/	No
h. Tin?	Yes	/	No
i. Dusty environments?	Yes	/	No
j. Any other hazardous exposures?	Yes	/	No
If "yes," describe these exposures: _____			
4. List any second jobs or side businesses you have: _____			
5. List your previous occupations: _____			
6. List your current and previous hobbies: _____			
7. Have you been in the military services?	Yes	/	No
If "yes," were you exposed to biological or chemical agents (either in training or combat)?			
8. Have you ever worked on a HAZMAT team?	Yes	/	No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)?			
	Yes	/	No
If "yes," name the medications if you know them: _____			
10. Will you be using any of the following items with your respirator(s)?			
a. HEPA filters:	Yes	/	No
b. Canisters (for example, gas masks):	Yes	/	No
c. Cartridges:	Yes	/	No
11. How often are you expected to use the respirator(s)?			
a. Escape-only (no rescue):	Yes	/	No
b. Emergency rescue only:	Yes	/	No
c. Less than 5 hours <i>per week</i> :	Yes	/	No
d. Less than 2 hours <i>per day</i> :	Yes	/	No
e. 2 to 4 hours per day:	Yes	/	No
f. Over 4 hours per day:			
12. During the period you are using the respirator(s), is your work effort:			
a. <i>Light</i> (less than 200 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____hrs. ____mins.			
Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.			
b. <i>Moderate</i> (200 to 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____hrs. ____mins.			
Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.			
c. <i>Heavy</i> (above 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____hrs. ____mins.			
Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).			
13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator?			
	Yes	/	No
If "yes," describe this protective clothing and/or equipment: _____			
14. Will you be working under hot conditions (temperature exceeding 77°F):	Yes	/	No
15. Will you be working under humid conditions:	Yes	/	No
16. Describe the work you will be doing while using your respirator(s): _____			
17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases): _____			
18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):			
Name of the first toxic substance: _____			
Estimated maximum exposure level per shift: _____			
Duration of exposure per shift: _____			
Name of the second toxic substance: _____			

Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 Name of the third toxic substance: \_\_\_\_\_  
 Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 The name of any other toxic substances that you will be exposed to while using your respirator: \_\_\_\_\_  
 19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security). \_\_\_\_\_

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62005, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62010 Follow these fit-testing procedures for tight-fitting respirators.**

• Temple bars of corrective eyewear or headgear that extend through the face seal area.

**IMPORTANT:**

- This section contains procedural requirements that apply during actual fit testing.
- See WAC 296-307-606 of this part for fit-testing requirements that apply to your overall program.

**Exemptions:** This section does NOT apply to employees who:

- Voluntarily use respirators
- OR**
- Are required to use mouthpiece respirators.

**You must:**

- Conduct fit testing according to all of the following:
  - Follow the procedure in Table 11 to choose a respirator for fit testing:

- Prior to conducting fit tests

**AND**

- Any time your employee must select a different respirator such as when a previously selected respirator fails a test
      - Select and follow at least one of the following fit test procedures:

- Qualitative fit-test procedures:

- ◆ Isoamyl acetate vapor (IAA, banana oil) in Table 12
        - ◆ Saccharine aerosol in Table 13
        - ◆ Bitrex™ aerosol in Table 14
        - ◆ Irritant smoke in Table 15

- Quantitative fit-test procedures:

- ◆ Ambient aerosol condensation nuclei counter such as the Portacount™, in Table 16
        - ◆ Controlled negative pressure (CNP) such as the Fit-Tester 3000™, in Table 17
        - ◆ Generated aerosol in Table 18

- Make sure employees perform the appropriate fit-test exercises listed in Table 19.
        - Clean and maintain equipment according to the manufacturer's instructions.
        - Make sure during fit testing employees wear any safety equipment that could:

- Interfere with respirator fit

**AND**

- Be worn in the workplace. For example, chemical splash goggles.
              - Check, prior to fit testing, for conditions that may interfere with the respirator seal or valve functions. If you find such conditions, do NOT conduct fit testing for that individual.

**Note:** Examples of conditions that may interfere with the respirator seal or valve functions include:

- Moustache, stubble, sideburns, bangs, hairline, and other types of facial hair in areas where the respirator facepiece seals or that interfere with valve function

**Table 11**

<b>Procedure for Choosing a Respirator for Fit Testing</b>
<p><b>1. Inform the employee:</b></p> <ul style="list-style-type: none"> <li>• To choose the most comfortable respirator that provides an adequate fit</li> <li>• That each respirator sample represents a different size and, if more than one model is supplied, a different shape</li> <li>• That if fitted and used properly, the respirator chosen will provide adequate protection</li> </ul> <p><b>2. Provide a mirror and show the employee how to:</b></p> <ul style="list-style-type: none"> <li>• Put on the respirator</li> <li>• Position the respirator on the face</li> <li>• Set strap tension.</li> </ul> <p><b>Note:</b> This instruction does NOT take the place of the employee's formal training since it is only a review.</p> <p><b>3. Review</b> with the employee how to check for a comfortable fit around the nose, cheeks and other areas on the face.</p> <ul style="list-style-type: none"> <li>• Tell the employee the respirator should be comfortable while talking or wearing eye protection.</li> </ul> <p><b>4. Have the employee</b> hold each facepiece against the face, taking enough time to compare the fit of each. The employee can then either:</p> <ul style="list-style-type: none"> <li>• Reject any facepiece that clearly does not feel comfortable or fit adequately</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Choose which facepiece is most acceptable and which is less acceptable, if any.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Supply as many respirator models and sizes as needed to make sure the employee finds a respirator that's acceptable and fits correctly</li> <li>• To save time later, during this step note the more acceptable facepieces in case the one chosen fails the fit test or proves unacceptable later.</li> </ul> <p><b>5. Have the employee wear</b> the most acceptable respirator for <b>AT LEAST 5 minutes</b> to evaluate comfort and fit. Do <b>ALL</b> of the following during this time:</p> <ul style="list-style-type: none"> <li>• Ask the employee to observe and comment about the comfort and fit:                             <ul style="list-style-type: none"> <li>– Around the nose, cheeks, and other areas on the face</li> <li>– When talking or wearing eye protection</li> </ul> </li> <li>• Have the employee put on the respirator and adjust the straps until they show proficiency</li> <li>• Evaluate the respirator's general fit by checking:                             <ul style="list-style-type: none"> <li>– Proper chin placement</li> </ul> </li> </ul>

<p><b>Procedure for Choosing a Respirator for Fit Testing</b></p> <ul style="list-style-type: none"> <li>- Properly tightened straps (do NOT over tighten)</li> <li>- Acceptable fit across the nose bridge</li> <li>- Respirator size; it must span the distance from nose to chin</li> <li>- To see if the respirator stays in position</li> </ul> <ul style="list-style-type: none"> <li>• Have the employee complete a successful seal check as specified in WAC 296-307-62020 of this chapter             <ul style="list-style-type: none"> <li>- Prior to the seal check they must settle the respirator on their face by taking a few slow deep breaths <b>WHILE SLOWLY:</b> <ul style="list-style-type: none"> <li>■ Moving their head from side-to-side</li> <li>AND</li> <li>■ Up and down.</li> </ul> </li> </ul> </li> </ul> <p>6. If the employee finds the respirator unacceptable, allow the employee to select another one and return to Step 5. Otherwise, proceed to Step 7.</p> <p>7. Before starting the fit test, you must:</p> <ul style="list-style-type: none"> <li>• Describe the fit test including screening procedures, employee responsibilities, and test exercises</li> <li>AND</li> <li>• Make sure the employee wears the respirator AT LEAST five minutes.</li> </ul>
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Table 12

<p><b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b></p> <p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• The success of this test depends on preserving the employee's odor sensitivity to isoamyl acetate (IAA) vapor             <ul style="list-style-type: none"> <li>- Vapor accumulations in ambient air can decrease odor sensitivity. To prevent this:                 <ul style="list-style-type: none"> <li>■ Prepare ALL solutions in a location separate from screening and test areas</li> <li>■ Conduct screening and tests in separate well-ventilated rooms. For example, use an exhaust fan or laboratory hood to prevent IAA vapor from accumulating in the room air</li> </ul> </li> <li>- Always use odor-free water, for example, distilled or spring water that's 25°C (77°F).</li> </ul> </li> <li>• Isoamyl acetate is also known as isopentyl acetate.</li> </ul> <p style="text-align: center;"><b>Screening Preparations</b></p> <p><b>Important:</b></p> <p>Odor threshold screening determines if the employee can detect weak concentrations of IAA vapor.</p> <ol style="list-style-type: none"> <li>1. Choose an appropriate location to conduct screening.             <ul style="list-style-type: none"> <li>• Conduct screening and tests in separate well-ventilated rooms.</li> </ul> </li> <li>2. Prepare a stock solution AT LEAST weekly as follows:             <ul style="list-style-type: none"> <li>• Add one milliliter (ml) of pure IAA to 800 ml of odor-free water in a one-liter glass jar with a metal lid using a measuring dropper or pipette</li> <li>• Seal the jar with the lid and shake it for 30 seconds</li> <li>• Clean the dropper or pipette.</li> </ul> </li> <li>3. Prepare the odor test solution daily as follows:             <ul style="list-style-type: none"> <li>• Add 0.4 ml from the stock solution to 500 ml of water in a one liter glass jar with a metal lid using a clean pipette or dropper</li> <li>• Seal the jar with the lid and shake it for 30 seconds</li> </ul> </li> </ol>
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<p><b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b></p> <ul style="list-style-type: none"> <li>• Let this solution stand for 2-3 minutes so the IAA concentration above the liquid reaches equilibrium</li> <li>• Label this jar so you know the contents but the employee cannot know its contents, for example, "1."</li> </ul> <p><b>Note:</b></p> <p>To maintain the integrity of the test, use labels that peel off easily AND periodically switch the labels.</p> <p>4. Prepare a "test blank" solution as follows:</p> <ul style="list-style-type: none"> <li>• Add 500 ml of odor-free water to a one liter glass jar with a metal lid</li> <li>• Seal the jar</li> <li>• Label the jar so you know the contents but the employee cannot know its contents.</li> </ul> <p>5. Type or neatly print the following instructions on a card and place it on the table in front of the two test jars:</p> <p><i>"The purpose of this test is to find out if you can smell banana oil at a low concentration. While both jars contain water, one ALSO contains a small amount of banana oil. Make sure the lid is secure then pick up a jar and shake it for two seconds. Open the jar and sniff at the opening. Repeat this for the second jar. Tell the individual conducting the fit test which jar contains banana oil."</i></p>
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<p style="text-align: center;"><b>Test Preparations</b></p> <ol style="list-style-type: none"> <li>6. Choose an appropriate location to conduct fit testing.             <ul style="list-style-type: none"> <li>• Conduct screening and tests in separate well-ventilated rooms.</li> </ul> </li> <li>7. Assemble the fit test enclosure in the room.             <ul style="list-style-type: none"> <li>• Invert a clear 55-gallon drum liner over a circular 2-foot diameter frame made of plywood or other light-weight rigid material OR construct a similar enclosure using plastic sheeting</li> <li>• Hang the frame with the plastic covering so the top of the enclosure is about six inches above the employee's head</li> <li>• Attach a small hook inside top center of the enclosure</li> <li>• Tape a copy of the test exercises (see Table 28) to the inside of the test enclosure where the employee can read it.</li> </ul> </li> <li>8. Have organic vapor cartridges or equivalent on hand for each employee's chosen respirator.</li> <li>9. Have ready a 6 x 5-inch piece of paper towel or other porous absorbent single-ply material AND 0.75 ml of pure IAA. Do NOT apply IAA yet.</li> </ol> <p><b>Note:</b></p> <p>As an alternative to using the paper towel, you may use an IAA test swab OR ampoule if it has been demonstrated to generate an equivalent test concentration.</p> <p style="text-align: center;"><b>Screening</b></p> <ol style="list-style-type: none"> <li>10. Have the employee, while NOT wearing a respirator, follow the instructions on the card provided.             <ul style="list-style-type: none"> <li>• If the employee correctly identifies the jar containing IAA, proceed to conduct testing (Step 11)</li> <li>• If the employee is NOT able to correctly identify the jar containing IAA, you must STOP and use a different fit test protocol.</li> </ul> </li> </ol>
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<b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b>
<b>Test</b>
<p>11. <b>BEFORE</b> entering the fit test room, have the employee attach cartridges, put on, properly adjust, and seal check the respirator. Have the employee enter the test enclosure.</p> <p>12. Wet the paper towel with 0.75 ml of <b>pure</b> IAA <b>AND</b> fold it in half.</p> <p>13. Pass the paper towel to the employee inside the enclosure <b>AND</b> instruct the employee to hang it on the hook at the top of the enclosure.</p> <p>14. Wait two minutes for the IAA vapor to fill the enclosure.</p> <ul style="list-style-type: none"> <li>• While waiting, explain the fit test, including the purpose of the test exercises, the importance of cooperation, and that you must be informed if a banana-like odor is detected during the test</li> <li>• You may also demonstrate the test exercises.</li> </ul> <p>15. Have the employee perform the appropriate fit-test exercises in Table 19.</p> <ul style="list-style-type: none"> <li>• If the employee does <b>NOT</b> detect IAA while performing test exercises, the fit test has been <b>PASSED</b>. Proceed as follows: <ul style="list-style-type: none"> <li>– <b>BEFORE</b> leaving the enclosure, have the employee break the respirator seal and inhale. If they <b>detect</b> IAA, the test is valid</li> <li>– When exiting the employee must remove the paper towel and give it to the individual conducting the fit test. This prevents IAA vapor from building up in the enclosure during subsequent tests</li> <li>– The individual conducting the fit test must keep used paper towels in a self-sealing plastic bag to prevent area contamination</li> </ul> </li> <li>• If the employee detects IAA during any test exercise, the fit test has <b>FAILED</b>. <b>STOP</b> and have the employee do the following: <ul style="list-style-type: none"> <li>– Quickly return to the selection room to remove the respirator. This avoids decreasing the employee's odor sensitivity</li> <li>– Select another respirator</li> <li>– Repeat screening and testing <ul style="list-style-type: none"> <li>■ At this stage, if the employee fails the screening part of this procedure, the employee can repeat it <b>AFTER</b> waiting at least five minutes for odor sensitivity to return.</li> </ul> </li> </ul> </li> </ul>

**Table 13**

<b>Saccharin Aerosol Test Procedure</b>
<b>Screening Preparations</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• Taste threshold screening determines whether the employee being tested can detect the taste of saccharin <ul style="list-style-type: none"> <li>– The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the fit test. Sweet foods or drink consumed before the test may make the employee unable to detect saccharin during screening</li> <li>– Nebulizers must be thoroughly rinsed in water and shaken dry:</li> </ul> </li> </ul>

<b>Saccharin Aerosol Test Procedure</b>
<ul style="list-style-type: none"> <li>■ Each morning and afternoon</li> <li><b>OR</b></li> <li>■ At least every four hours.</li> <li>• You may use commercially prepared solutions if they meet the requirements in this procedure.</li> </ul> <p>1. Obtain a test enclosure (hood) that meets the following specifications:</p> <ul style="list-style-type: none"> <li>• Twelve inches in diameter by fourteen inches tall</li> <li>• A clear front portion</li> <li>• Enough space inside to allow free movement of the head when a respirator is worn</li> <li>• A 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications</li> <li>• This enclosure can also be used for testing.</li> </ul> <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers <b>OR</b> equivalent.</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> <li>• Dissolve 83.0 milligrams of sodium saccharin USP in 100 ml of warm distilled water</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• <b>IF</b> you have already prepared the fit-test solution, you can make the screening solution by adding 1 ml of this solution to 100 ml of distilled water.</li> </ul> <p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one to be used for fit testing.</li> </ul>
<b>Test Preparations</b>
<p>5. Prepare the fit-test solution as follows:</p> <ul style="list-style-type: none"> <li>• Add 83.0 grams of sodium saccharin to 100 ml of warm water.</li> </ul> <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one used for screening</li> </ul> <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>
<b>Screening</b>
<p>8. Have the employee, while <b>NOT</b> wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breath through a slightly open mouth with tongue extended during screening <b>AND</b> testing</li> <li>• Immediately report when a sweet taste is detected.</li> </ul> <p>10. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer saccharin as follows:</p> <ul style="list-style-type: none"> <li>• Direct the nozzle away from the employee's nose and mouth</li> <li>• Complete 10 squeezes in rapid succession</li> <li>• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.</li> </ul> <p>11. Ask the employee if a sweet taste is detected.</p> <ul style="list-style-type: none"> <li>• If <b>YES</b>, screening is completed. Proceed to conduct testing, Step 14, <b>AFTER</b> you: <ul style="list-style-type: none"> <li>– Ask the employee to remember the taste for reference during the fit test</li> </ul> </li> </ul>

<b>Saccharin Aerosol Test Procedure</b>
<p>– Note the employee's taste threshold as "10" regardless of the number of squeezes actually completed</p> <ul style="list-style-type: none"> <li>• If <b>NO</b>, screening must continue. Proceed to Step 12.</li> </ul> <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; <b>EXCEPT</b> this time note the employee's taste threshold as "20" <b>IF</b> a sweet taste is reported.</p> <ul style="list-style-type: none"> <li>• If a sweet taste is still <b>NOT</b> detected, repeat with 10 more squeezes and follow Step 11 one last time; <b>EXCEPT</b> this time note "30" for the taste threshold <b>IF</b> a sweet taste is reported.</li> </ul> <p>13. If <b>NO</b> sweet taste is reported after 30 squeezes, you must <b>STOP</b> and choose a different fit-test protocol for the employee.</p>
<b>Test</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• Periodically check nebulizers to make sure they do not clog during use. A test is <b>NOT</b> valid if the nebulizer is clogged at the end of the test.</li> </ul> <p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure (hood).</p> <p>15. Instruct the employee to immediately report if a sweet taste is detected.</p> <p>16. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> <li>• Replenish the aerosol in the hood <b>EVERY</b> 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15</li> <li>• The employee must report if a sweet taste is detected:             <ul style="list-style-type: none"> <li>– If <b>NO</b> saccharin is tasted, the test has been <b>PASSED</b> <ul style="list-style-type: none"> <li>■ If saccharin is tasted the test has <b>FAILED</b>, have the employee select another respirator <b>AND</b></li> <li>■ Repeat screening and testing.</li> </ul> </li> </ul> </li> </ul>

**Table 14**

<b>Bitrex™ Aerosol Test Procedure</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• Bitrex™ (denatonium benzoate) is routinely used as a taste aversion agent in household liquids that children shouldn't drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers</li> <li>• The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the fit test.</li> </ul>
<b>Screening Preparations</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• Taste threshold screening determines whether the employee being tested can detect the taste of Bitrex™</li> <li>• Nebulizers must be thoroughly rinsed in water and shaken dry:</li> </ul>

<b>Bitrex™ Aerosol Test Procedure</b>
<ul style="list-style-type: none"> <li>– Each morning and afternoon</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>– At least every four hours.</li> </ul> <ul style="list-style-type: none"> <li>• You may use commercially prepared solutions if they meet the requirements in this procedure.</li> </ul> <p>1. Obtain a test enclosure that meets the following specifications:</p> <ul style="list-style-type: none"> <li>• Twelve inches in diameter by fourteen inches tall</li> <li>• A clear front portion</li> <li>• Enough space inside the front to allow free movement of the head when a respirator is worn</li> <li>• 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications</li> <li>• This enclosure can also be used for testing.</li> </ul> <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers <b>OR</b> equivalent:</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> <li>• Make up a 5% salt solution by dissolving 5.0 grams of salt (sodium chloride) into 100 ml of distilled water</li> <li>• Dissolve 13.5 milligrams of Bitrex™ in the salt solution.</li> </ul> <p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one to be used for fit testing.</li> </ul>
<b>Test Preparations</b>
<p>5. Prepare the fit test solution.</p> <ul style="list-style-type: none"> <li>• Dissolve 10.0 grams of salt (sodium chloride) into 200 ml of distilled water</li> <li>• Add 337.5 milligrams of Bitrex™ to the warmed salt solution.</li> </ul> <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one used for screening.</li> </ul> <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>
<b>Screening</b>
<p><b>Important:</b></p> <p>The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the screening and test</p> <p>8. Have the employee, while <b>NOT</b> wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breathe through a slightly opened mouth with tongue extended during screening <b>AND</b> testing</li> <li>• Immediately report when a bitter taste is detected.</li> </ul> <p>10. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer Bitrex™ as follows:</p> <ul style="list-style-type: none"> <li>• Direct the nozzle away from the employee's nose and mouth</li> <li>• Complete 10 squeezes in rapid succession</li> <li>• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.</li> </ul>

<b>Bitrex™ Aerosol Test Procedure</b>
<p>11. Ask the employee whether a bitter taste is detected.</p> <ul style="list-style-type: none"> <li>• If <b>YES</b>, screening is completed. Proceed to conduct testing, Step 14, <b>AFTER</b> you:                             <ul style="list-style-type: none"> <li>– Ask the employee to remember the taste for reference during the fit test</li> <li>– Note the employee's taste threshold as "10," regardless of the number of squeezes actually completed</li> </ul> </li> <li>• If <b>NO</b>, screening must continue. Proceed to Step 12.</li> </ul> <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; <b>EXCEPT</b> this time note the employee's taste threshold as "20" <b>IF</b> a bitter taste is reported.</p> <ul style="list-style-type: none"> <li>• If a bitter taste is still <b>NOT</b> detected repeat with 10 more squeezes and follow Step 11 one last time; <b>EXCEPT</b> this time note "30" for the taste threshold <b>IF</b> a bitter taste is reported.</li> </ul> <p>13. If <b>NO</b> bitter taste is reported after 30 squeezes, you must <b>STOP</b> and choose a different fit-test protocol for the employee.</p>
<b>Test</b>
<p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure.</p> <p>15. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breathe through a slightly opened mouth with tongue extended during screening <b>AND</b> testing</li> <li>• Immediately report when a bitter taste is detected.</li> </ul> <p>16. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> <li>• Replenish the aerosol in the hood <b>EVERY</b> 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15</li> <li>• The employee must report if a bitter taste is detected:                             <ul style="list-style-type: none"> <li>– If <b>NO</b> Bitrex™ is tasted, the test has been <b>PASSED</b></li> <li>– If Bitrex™ is tasted the test has <b>FAILED</b>. Have the employee:                                     <ul style="list-style-type: none"> <li>■ Select another respirator</li> <li><b>AND</b></li> <li>■ Repeat all screening and testing steps.</li> </ul> </li> </ul> </li> </ul>

**Table 15**

<b>Irritant Smoke (Stannic Chloride) Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• <b>DO NOT USE A TEST ENCLOSURE OR HOOD FOR THIS FIT TEST!</b></li> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• During this test an employee is exposed to irritating smoke containing hydrochloric acid produced by a stannic chloride ventilation smoke tube to detect leakage. The smoke will irritate eyes, lungs, and nasal passages</li> <li>• Employee sensitivity varies, and certain employees may respond more intensely than others exposed to irritant smoke. The individual conducting the fit test must take precautions to minimize the employees' exposure to irritant smoke</li> </ul>

<b>Irritant Smoke (Stannic Chloride) Test Procedure</b>
<ul style="list-style-type: none"> <li>• Conduct fit testing in an area with adequate ventilation to prevent exposure of the individual conducting the fit test and build-up of irritant smoke in the ambient air.</li> </ul>
<b>Screening AND Test Preparations</b>
<p><b>Important:</b></p> <p>Sensitivity screening is necessary to determine whether the employee can detect a weak concentration of irritant smoke <b>AND</b> whether any gross facepiece leakage is detected.</p> <ol style="list-style-type: none"> <li>1. Obtain only stannic chloride (ventilation) smoke tubes, <b>AND</b> an aspirator squeeze bulb <b>OR</b> use a low-flow air pump set to deliver 200 milliliters of air flow per minute.</li> <li>2. Equip the employee's chosen respirator with P100 series filters if a negative pressure air-purifying respirator will be tested. If a powered air-purifying respirator (PAPR) will be tested equip the respirator with high-efficiency particulate air (HEPA) filters.</li> </ol>
<b>Screening</b>
<p><b>Important!</b></p> <p>When performing sensitivity screening checks use only the <b>MINIMUM</b> amount of smoke necessary to elicit a response from the employee.</p> <ol style="list-style-type: none"> <li>3. Advise the employee that the smoke can be irritating to eyes, lungs, and nasal passages <b>AND</b> instruct the employee to keep eyes closed while exposed.</li> <li>4. Break both ends of the ventilation smoke tube <b>AND</b> fit a short piece of plastic tubing, for example, two-to-six inches of tygon tubing, over one end to prevent exposure to the sharp end of the tube. Connect the other end to an aspirator bulb or a low-flow air pump set to deliver a flow of 200 ml per minute.</li> <li>5. While the employee is <b>NOT</b> wearing a respirator, have the employee smell a weak concentration of irritant smoke to become familiar with its irritating properties.                             <ul style="list-style-type: none"> <li>• Carefully direct a small amount of irritant smoke toward the employee.</li> </ul> </li> </ol>
<b>Test</b>
<ol style="list-style-type: none"> <li>Test 6. Have the employee attach respirator filters, put on, adjust, and seal check the respirator without assistance. The employee must be proficient at these tasks.</li> <li>7. Remind the employee to keep eyes closed during testing.</li> <li>8. Direct a stream of irritant smoke toward the respirator's face seal area as follows:                             <ul style="list-style-type: none"> <li>• Begin at least 12 inches from the facepiece <b>AND</b> move the smoke around the whole perimeter of the mask</li> <li>• Gradually make two more passes around the perimeter of the facepiece, moving to within 6 inches of the respirator</li> <li>• <b>STOP</b> at any time the employee detects smoke in the facepiece. If this occurs a different respirator will need to be chosen and tested, beginning with sensitivity screening.</li> </ul> </li> <li>9. Have the employee perform appropriate fit-test exercises in Table 19 <b>IF</b> the employee has <b>NOT</b> had an involuntary response such as evidence of coughing, flinching, or other response, <b>OR</b> detected smoke in the facepiece.                             <ul style="list-style-type: none"> <li>• Continue to direct smoke from a distance of 6 inches around the facepiece perimeter</li> </ul> </li> </ol>

**Irritant Smoke (Stannic Chloride) Test Procedure**

- If smoke is detected at any time the test has **FAILED**. A different respirator must be chosen and tested, starting with sensitivity screening
  - If **NO** smoke is detected proceed to Step 10.
10. Have the employee remove the respirator **AND** perform another sensitivity screening check as follows:
- Continue to use the smoke tube used for fit testing
  - Carefully direct a **SMALL** amount of irritant smoke toward the employee
    - The test has been **PASSED IF** the employee responds to the smoke
    - The fit test is **VOIDED IF** the employee does **NOT** respond to the smoke.

**Table 16****Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure****Important:**

- This is a quantitative (QNFT) fit-test procedure
- This method uses a particle counting instrument that measures and compares the particle concentration both inside and outside the respirator facepiece while the employee performs a series of test exercises
- Particles in the ambient air are used as the test aerosol.

**Test Preparations**

1. Obtain a test instrument such as a Portacount™.
2. Have probed respirators available for each respirator model and size the employer uses, **OR** have a sampling adapter available if the employee's actual or chosen respirator will be tested.

**Note:**

- A probed respirator has a special fitting installed on the facepiece designed to connect with the end of the test instrument's plastic sampling tube so that air samples can be taken inside the facepiece. Probed respirators can be obtained from the respirator manufacturer, or distributor, **AND** can only be used for fit-testing purposes
- Contact TSI Inc., **OR** the respirator's manufacturer to obtain probed respirators or facepiece sampling adapters.

3. Follow the test instrument manufacturer's instructions for test preparation, including particle, zero, and system checks. Make sure the instrument's pass **OR** fail criterion is programmed to the following **MINIMUM** performance levels:

- For half-facepiece respirators, an overall minimum fit factor of 100 as a passing level
- For full-facepiece respirators, an overall minimum fit factor of 500 as a passing level

4. Have high-efficiency particulate air (HEPA) filters, **OR** other respirator filters available that are capable of preventing significant penetration by particles generated by the test instrument such as, P100 or N95 series filters.

- If you'll use a sampling adapter instead of probed respirators be sure to have the correct type for the respirators chosen.

**Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure****Test**

5. Properly attach the sampling line to the facepiece probe or sampling adapter.
6. Have the employee attach respirator filters, put on, properly adjust, and wear the respirator five minutes **BEFORE** the fit test. During this time you and the employee must evaluate the respirator's general fit by checking:
  - Proper chin placement
  - Properly tightened straps (do **NOT** over tighten)
  - Acceptable fit across the nose bridge
  - Respirator size. It must span the distance from nose to chin
  - To see if the respirator stays in position.

**Note:**

Wearing the respirator for five minutes permits the employee to make certain the respirator is comfortable **AND** allows for purging of ambient particles trapped inside the facepiece.

7. Have the employee perform a seal check. Make sure the sampling line is crimped to avoid leakage during the seal check. If **NO** leakage is detected, proceed to Step 8. If leakage is detected:

- Determine the cause

**AND**

- If leakage is due to a poorly fitting facepiece, have the employee:

- Choose another respirator size or model

**AND**

- Start again at Step 6.

8. Start the fit test cycle.

- Follow the manufacturer's instructions for operating the test instrument
- Have the employee perform the appropriate fit-test exercises in Table 19
  - The test instrument will automatically stop and calculate the overall fit factor. Use this result to determine whether or not the test is passed

- The test has been **PASSED** if the overall fit factor is at least 100 for a half facepiece, **OR** 500 for a full facepiece

- The test has **FAILED** if the overall fit factor is below 100 for a half facepiece or 500 for a full facepiece.

**Note:**

If the test has failed, have the employee select another respirator model or size following Table 11 **AND** repeat this procedure.

**Table 17****Controlled Negative Pressure (CNP) Test Procedure****Important!**

- This is a quantitative fit-test (QNFT) procedure
- This method determines respirator fit by measuring how much the facepiece leaks when it is subject to a slight negative pressure **AFTER** various premeasurement activities
- Measurements occur while employees remain still **AND** hold their breath for 10 seconds

<p><b>Controlled Negative Pressure (CNP) Test Procedure</b></p> <ul style="list-style-type: none"> <li>No test aerosols are used. Respirator cartridges aren't needed for this test.</li> </ul>
<p><b>Test Preparations</b></p> <ol style="list-style-type: none"> <li>Make sure the individual conducting the fit test is thoroughly trained to perform this test.</li> <li>Obtain a CNP test instrument such as a FitTester 3000™. Make sure:                     <ul style="list-style-type: none"> <li>Defaults are set at:                             <ul style="list-style-type: none"> <li>-15mm (-0.58 inches) of water test pressure</li> </ul> </li> <li>AND</li> <li>A modeled inspiratory flow rate of 53.8 liters per minute</li> <li>It has an effective audio warning device that signals when employees fail to hold their breath.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>You are not required to obtain test recording and printing equipment such as computers OR printers. Hand recording results is acceptable</li> <li>To see default settings, check the instrument's "REDON protocol."</li> </ul> </li> <li>Obtain facepiece adapters appropriate for each test respirator.                     <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>Adapters are either a one-piece (for SCBA facepieces), OR two-piece (for dual cartridge facepieces) device providing a manifold and breathing valve system. For positive pressure respirators, you will need to obtain an additional fitting, available from the respirator manufacturer, to convert the facepiece to negative pressure</li> <li>To obtain adapters, contact the CNP instrument's distributor, Occupational Health Dynamics, OR the respirator manufacturer.</li> </ul> </li> </ol>
<p><b>Test</b></p> <p><b>Important!</b> After the test, you must ask the employee about the comfort of the respirator AND if the respirator has become unacceptable, another size or model must be chosen and tested.</p> <ol style="list-style-type: none"> <li>Explain the test procedure to the employee.</li> <li>Train the employee on how to hold a breath for at least 20 seconds.</li> <li>Prepare the respirator for the fit test as follows:                     <ul style="list-style-type: none"> <li>Remove or prop open the inhalation valves. If a breathing tube is present, disconnect it</li> <li>Replace cartridges, if present, with the manifold and breathing valve adapter                             <ul style="list-style-type: none"> <li>For positive pressure facepieces, mount the manufacturer's additional fitting followed by the manifold-breathing valve adapter</li> </ul> </li> <li>Connect the respirator to the CNP device according to the CNP instrument manufacturer's directions.</li> </ul> </li> <li>Have the employee put on, adjust, and seal check the respirator.</li> <li>Turn on the instrument AND have the employee stand and perform the fit-test exercises in Table 19.</li> <li>Interpret the test results:                     <ul style="list-style-type: none"> <li>The test is <b>PASSED IF</b> the overall fit factor obtained is at least 100 for a half facepiece, or at least 500 for a full facepiece</li> </ul> </li> </ol>

<p><b>Controlled Negative Pressure (CNP) Test Procedure</b></p> <ul style="list-style-type: none"> <li>The test has <b>FAILED IF</b> the fit factor is less than 100 for a half facepiece; 500 for a full facepiece                     <ul style="list-style-type: none"> <li>If the test has <b>FAILED</b> you must have the employee select another respirator model or size following the steps in Table 11 AND repeat this procedure, starting at Step 6.</li> </ul> </li> </ul>
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Table 18

## Generated Aerosol Test Procedure

**Important:**

- This is a quantitative (QNFT) fit-test procedure
- In this method, a test aerosol is used to challenge the facepiece seal while aerosol concentrations inside and outside the facepiece are measured during test exercises
- Special equipment is needed to generate, disperse, detect, and measure test aerosols.

**Test Preparations**

1. Test aerosol.
  - Use a particulate, for example, corn oil, polyethylene glycol 400, di-2-ethyl hexyl sebacate, or sodium chloride.
2. Instrumentation.
  - Do **ALL** the following:
    - Obtain and use aerosol generation, dilution, and measurement systems appropriate for particulates
    - Use an aerosol-generating instrument that will maintain test concentrations within a 10% variation
    - Select a sampling instrument that allows for a computer record or strip chart record to be created
      - The record must show the rise and fall of test agent concentration during each inhalation and exhalation at fit factors of at least 2000.
    - **Note:** Integrators, or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise, may be used if a record of the readings is made.
    - Minimize the time interval between the activity and the recording of the activity so you can clearly connect what you see to what is being recorded. For example, use a small diameter and length of sampling line.
3. Test enclosure.
  - Do **ALL** the following:
    - Make sure the enclosure is equipped and constructed to effectively:
      - Maintain a uniform concentration of the test agent inside the enclosure. For example, the enclosure must be large enough to allow **ALL** employees freedom of movement during testing **WITHOUT** disturbing the test concentration or measurement instrument
      - Keep the test agent from contaminating the air outside the enclosure. For example, use a HEPA filter to purify exhausted air
      - Allow the individual conducting the fit test to view the employee during the test
    - Make sure the tubing used to collect samples from the enclosure **AND** respirator is the same material, diameter, **AND** length. This makes the effect of aerosol loss caused by deposition in each sample line equal
    - If sodium chloride is used, relative humidity inside the enclosure must be kept below 50%.
4. Prepare test respirators.
  - Do **ALL** the following:
    - Inspect test respirators regularly for missing parts **AND** damage
    - Keep test respirators in proper working order
    - Make sure in-mask sampling probes are:
      - Designed and installed so the air sample will be drawn from the employee's breathing zone; midway between the nose and mouth
    - **AND**
      - The probe extends inside the facepiece at least 1/4 inch
    - Make sure sampling ports such as probes, or adapters on respirators are constructed and installed so they do **NOT**:
      - Block air flow into the sampling line
      - Leak
      - Interfere with the respirator's fit or performance
  - Have high efficiency particulate air (HEPA) filters **OR** P100 series filter available
    - Replace filters when increased breathing resistance is detected **OR** when the test agent has altered the filter material's integrity.

**Test****Important!**

- Throughout the test, maintain the employee's exposure to any test agent below the established exposure limit. Exposures allowed must be based on exposure time and exposure limit duration
  - If a single peak penetration exceeds 5% for half facepieces **OR** 1% for full facepieces:
    - **STOP** the test
  - **AND**
    - Have the employee select another respirator for testing.
5. Have the employee attach filters, put on, adjust, and seal check the respirator.
    - Be sure to crimp the sampling line to avoid pressure leaks during the seal check
    - **AND**
      - Have the employee adjust the respirator straps, without assistance, so the fit is comfortable. Do **NOT** over tighten.

**Generated Aerosol Test Procedure**

6. **OPTIONAL Step.** To save time conduct a screening test to quickly identify poorly fitting respirators.
- Note:**  
You may use a qualitative screening test **OR** an ambient aerosol condensation nuclei counter instrument in the count mode.
7. Make sure test aerosol concentration is reasonably stable.
- If a canopy or shower curtain enclosure is used, determine stability of the test aerosol concentration **AFTER** the employee enters the enclosure.
8. Have the employee enter the test enclosure and connect the respirator to the sample lines.
9. Immediately after entering the enclosure measure test aerosol concentration inside the respirator.
- Make sure the peak penetration does **NOT** exceed 5% for half facepieces, **OR** 1% for full facepieces.
10. Have employee perform the appropriate fit-test exercises in Table 19.
- Do **NOT** adjust the respirator once exercises begin.
11. Calculate the overall fit factor as specified in Steps 12-13. The fit test is:
- **PASSED IF** the minimum fit factor of 100 for half facepieces **OR** 500 for full facepieces is obtained
- OR**
- If a passing fit factor is **NOT** obtained, the test has **FAILED** and you must have the employee select and test another respirator.

**Calculations**

**Important!**

- Do **NOT** count the grimace exercise measurements during these calculations
  - Take into account the limitations of instrument detection when determining fit factors.
12. Calculate individual fit factors for **EACH** exercise by applying the following:  
Exercise fit factor (ffE) = 
$$\frac{\text{Average test enclosure concentration}}{\text{Test aerosol concentration inside the respirator}}$$
- To determine the average test enclosure concentration use one of the following methods:
    - Arithmetic average of the concentration before and after each **test** (an average of two values per entire test)
    - Arithmetic average of concentration before and after each **exercise** (an average of two values per exercise)
    - True average measured continuously during the respirator sample
  - Determine the test aerosol concentration inside the respirator in one of the following ways:
    - Average peak penetration values. Determine aerosol penetration for each exercise by:
      - Using integrators or computers that calculate the actual test agent penetration
    - OR**
    - Average the peak heights shown on the strip chart recording, graph, or by computer integration
      - Maximum peak penetration. Use strip chart recordings to determine the highest peak penetration for each exercise and use this value
      - Area under the peaks. Use computerized integration or other appropriate calculations to integrate the area under individual peaks for each exercise.
13. Using individual exercise fit factors (ffE) calculate the **overall fit factor** by doing **ALL** of the following:
- Convert each exercise fit factor to a penetration value
  - Determine the average penetration value
  - Convert the average penetration value back to a fit factor
- OR**
- Use this equation to calculate the **overall fit factor**:
- Overall fit factor = 
$$\frac{n}{1/ffE1 + 1/ffE2 + 1/ffE3 \dots + 1/ffEn}$$

**Table 19**

**Fit-Test Exercises**

- Important:**
- This list applies when you use any fit test
  - Employees tested must perform **ALL** exercises marked with an "X" as described for the fit-test procedure used
    - Once exercises begin, any adjustments made void the test **AND** you must begin again
    - After test exercises are completed, you must ask the employee about the comfort of the respirator. If it has become unacceptable, have the employee choose another one for testing
  - When the controlled negative pressure procedure is used, **STOP and repeat** the test if the employee adjusts the respirator **OR** takes a breath and fails to hold it for 10 seconds

<b>Fit-Test Exercises</b>			
• Controlled negative pressure tests conducted according to the method published in 29 CFR 1910.134, Appendix A are an acceptable alternative to the method outlined below.			
<b>Description of Required Fit-Test Exercises</b>	<b>Fit-Test Procedures</b>		
	Qualitative Procedures	Quantitative Procedures; EXCEPT the CNPP	Controlled Negative Pressure Procedure (CNPP)
• Normal breathing – Breathe normally, while standing for one minute	X	X	
• Deep breathing – Breathe slowly and deeply while standing for one minute – Take caution to avoid hyperventilating	X	X	
• Head side to side – Slowly turn head from side to side while standing for one minute, pausing at each extreme position to inhale – Be careful to NOT bump the respirator	X	X	
• Head up and down – Slowly move head up and down while standing for one minute, inhaling in the up position – Be careful to NOT bump the respirator	X	X	
• Talking – Talk slowly and loud enough to be heard clearly by the individual conducting fit testing for one minute. Choose <b>ONE</b> of the following: ■ Read from a prepared text such as the Rainbow Passage <sup>1</sup> ■ Count backward from 100 ■ Recite a memorized poem or song.	X	X	
• Grimace – Smile or frown for fifteen seconds.		X	
• Bending over – Bend over to touch toes while standing. Repeat at a comfortable pace for one minute <b>OR</b> – Jog in place for one minute if the test enclosure, such as a hood, does not permit bending over	X	X	
• Normal breathing – Breathe normally while standing for one minute	X	X	
• Face forward – <b>Premeasurement activity:</b> Stand and breath normally, without talking – <b>Measurement position:</b> Face forward while holding breath for 10 seconds			X
• Bending over – <b>Premeasurement activity:</b> While standing, bend over to touch toes – <b>Measurement position:</b> Hold the bending position with face parallel to the floor while holding breath for 10 seconds			X
• Head shaking – <b>Premeasurement activity:</b> Vigorously shake head from side to side for 3 seconds while shouting or making the sound of "BRRRR" loudly – <b>Measurement position:</b> Face forward, while holding breath for 10 seconds			X
• Redon-1 – <b>Premeasurement activity:</b> Remove the respirator completely and put it back on			X

Fit-Test Exercises			
– <b>Measurement position:</b> Face forward while holding breath for 10 seconds			
• Redon-2 – Repeat the premeasurement activity and measurement position described in Redon-1			X

The Rainbow Passage:

"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62010, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62015 Follow procedures established for cleaning and disinfecting respirators.**

**You must:**

- Follow the procedure in Table 20 for cleaning and disinfecting respirators.

**Table 20  
Respirator Cleaning Procedure**

Step	Task
1.	Remove filters, cartridges, canisters, speaking diaphragms, demand and pressure valve assemblies, hoses, or any components recommended by the manufacturer. • Discard or repair any defective parts.
2.	Wash components in warm (43°C (110°F) maximum) water with a mild detergent or with a cleaner recommended by the manufacturer • A stiff bristle (not wire) brush may be used to help remove the dirt • If the detergent or cleaner does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following: – A bleach solution (concentration of 50 parts per million of chlorine). Make this by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F) – A solution of iodine (50 parts per million iodine). Make this in two steps: ■ First, make a tincture of iodine by adding 6-8 grams of solid ammonium iodide and/or potassium iodide to 100 cc of 45% alcohol approximately ■ Second, add 0.8 milliliters of the tincture to one liter of water at 43°C (110°F) to get the final solution – Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
3.	Rinse components thoroughly in clean, warm (43°C (110°F) maximum), preferably, running water. <b>Note:</b> The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces could cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts, if not completely removed.
4.	Drain components.
5.	Air-dry components or hand dry components with a clean, lint-free cloth.
6.	Reassemble the facepiece components. • Replace filters, cartridges, and canisters, if necessary (for testing).
7.	Test the respirator to make sure all components work properly.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62015, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62020 Follow procedures established for seal checking respirators.**

**IMPORTANT:**

- User seal checks are **NOT** a substitute for fit tests. See WAC 296-307-62010 for fit test procedures.
- You may use a seal check procedure recommended by the respirator manufacturer **INSTEAD** of the procedure outlined in Table 21 if you can demonstrate the procedure is based on a scientific study that, for example, demonstrates

the procedure effectively identifies respirators that fit poorly when put on or adjusted.

**You must:**

- Make sure employees perform a user seal check as outlined in Table 21, **EACH TIME** the respirator is worn, to make sure the seal is adequate.

Table 21

<b>User Seal Check Procedure</b>
<p><b>Important information for employees:</b></p> <ul style="list-style-type: none"> <li>• You need to conduct a seal check <b>each time</b> you put your respirator on <b>BEFORE</b> you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit tested by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems</li> <li>• The procedure below has two parts; a positive pressure check and a negative pressure check. <b>You must complete both parts each time.</b> It should only take a few seconds to perform, once you learn it <ul style="list-style-type: none"> <li>– If you cannot pass both parts, your respirator is NOT functioning properly, see your supervisor for further instruction.</li> </ul> </li> </ul>
<p><b>Positive pressure check:</b></p> <ol style="list-style-type: none"> <li>1. Remove exhalation valve cover, if removable.</li> <li>2. Cover the exhalation valve completely with the palm of your hand <b>WHILE</b> exhaling gently to inflate the facepiece slightly.</li> <li>3. The respirator facepiece should remain inflated (indicating a build-up of positive pressure and <b>NO</b> outward leakage). <ul style="list-style-type: none"> <li>• If you detect <b>NO</b> leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check</li> <li>• If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.</li> </ul> </li> </ol>
<p><b>Negative pressure check:</b></p> <ol style="list-style-type: none"> <li>4. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands <b>WHILE</b> inhaling gently to collapse the facepiece slightly. <ul style="list-style-type: none"> <li>• If you cannot use the palm(s) of your hands to effectively cover the inhalation openings on cartridges or canisters, you may use: <ul style="list-style-type: none"> <li>– Filter seal(s) (if available)</li> </ul> </li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>– Thin rubber gloves.</li> </ul> </li> <li>5. Once the facepiece is collapsed, hold your breath for 10 seconds <b>WHILE</b> keeping the inhalation openings covered.</li> <li>6. The facepiece should remain slightly collapsed (indicating negative pressure and <b>NO</b> inward leakage). <ul style="list-style-type: none"> <li>• If you detect <b>NO</b> evidence of leakage, the tightness of the facepiece is considered adequate, the procedure is completed, and you may now use the respirator</li> <li>• If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat <b>BOTH</b> the positive and negative fit checks.</li> </ul> </li> </ol>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62020, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-622 Definitions.**

#### **Air-purifying respirator (APR)**

A respirator equipped with an air-purifying element such as a filter, cartridge, or canister, **OR** having a filtering facepiece, for example, a dust mask.

[Title 296 WAC—p. 2606]

The element or filtering facepiece is designed to remove specific contaminants, such as particles, vapors, or gases, from air that passes through it.

#### **Air-line respirator**

An atmosphere-supplying respirator for which breathing air is drawn from a source separate from and not worn by the user, such as:

- A cylinder or a tank
- A compressor
- An uncontaminated environment.

#### **Air supplied respirator (see air-line respirator)**

#### **Assigned protection factor (APF)**

Indicates the expected level of workplace respiratory protection **WHEN** the respirator is:

- Functioning properly

**AND**

- Fitted to the user

**AND**

- Worn by trained individuals

**AND**

• Used with the limitations specified on the NIOSH approval label.

#### **Atmosphere-supplying respirator**

A respirator that supplies the user with breathing air from sources, such as:

- A cylinder or a tank
- A compressor
- An uncontaminated environment.

#### **Breathing air**

Air supplied to an atmosphere-supplying respirator. This air meets the specifications found in WAC 296-307-616.

#### **Canister or cartridge (air-purifying)**

Part of an air-purifying respirator that consists of a container holding materials such as fiber, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

#### **Cartridge respirator (see also air-purifying respirator)**

An air-purifying respirator equipped with one or more cartridges. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

#### **Demand respirator**

An atmosphere-supplying respirator that sends breathing air to the facepiece only when suction (negative pressure) is created inside the facepiece by inhalation. Demand respirators are "**negative pressure**" respirators.

#### **Dust mask**

A name used to refer to filtering-facepiece respirators. Dust masks may or may not be NIOSH certified. See filtering facepiece.

#### **Emergency respirator**

Respirators suitable for rescue, escape, or other activities during emergency situations.

#### **Emergency situation**

Any occurrence that could **OR** does result in a significant uncontrolled release of an airborne contaminant. Causes of emergency situations include, but are not limited to, equipment failure, rupture of containers, or failure of control equipment.

(2007 Ed.)

**End-of-service-life indicator (ESLI)**

A system that warns the air-purifying respirator user that cartridges or canisters must be changed. An example of an ESLI is a dot on the respirator cartridge that changes color.

**Escape-only respirator**

A respirator that can only be used to exit during emergencies. Look for this use limitation on the respirator's NIOSH approval label.

**Exposed, or exposure**

The contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

**Filter**

Fibrous material that removes dust, spray, mist, fume, fog, smoke particles, **OR** other aerosols from the air.

**Filtering-facepiece respirator**

A tight-fitting, half-facepiece, negative-pressure, particulate air-purifying respirator with the facepiece **MAINLY** composed of filter material. These respirators do not use cartridges or canisters and may have sealing surfaces composed of rubber, silicone or other plastic-like materials. They are sometimes referred to as "dust masks."

**Fit factor**

A number providing an estimate of fit for a particular respiratory inlet covering to a specific individual during quantitative fit testing.

**Fit test (see also qualitative fit test and quantitative fit test)**

Fit testing is an activity where the facepiece seal of a respirator is challenged, using a WISHA accepted procedure, to determine if the respirator provides an adequate seal.

**Full-facepiece respirator**

A tight-fitting respirator that covers the wearer's nose, mouth, and eyes.

**Gas mask**

An air-purifying respirator equipped with one or more canisters. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

**Half-facepiece respirator**

A tight-fitting respirator that only covers the wearer's nose and mouth.

**Helmet**

The rigid part of a respirator that covers the wearer's head **AND** also provides head protection against impact or penetration.

**High-efficiency particulate air filter (HEPA)**

A powered air purifying respirator (PAPR) filter that removes at least 99.97% of monodisperse dioctyl phthalate (DOP) particles with a mean particle diameter of 0.3 micrometer from contaminated air.

**Note:** Filters designated, under 42 CFR Part 84, as an "N100," "R100," or "P100" provide the same filter efficiency (99.97%) as HEPA filters.

**Hood**

The part of a respirator that completely covers the wearer's head and neck **AND** may also cover some or all of the shoulders and torso.

**Immediately dangerous to life or health (IDLH)**

An atmospheric condition that would:

- Cause an immediate threat to life

**OR**

- Cause permanent or delayed adverse health effects

**OR**

- Interfere with an employee's ability to escape.

**Licensed healthcare professional (LHCP)**

An individual whose legally permitted scope of medical practice allows him or her to provide **SOME OR ALL** of the healthcare services required for respirator users' medical evaluations.

**Loose-fitting facepiece**

A respiratory inlet covering that is designed to form a partial seal with the face.

**Negative-pressure respirator**

Any tight-fitting respirator in which the air pressure inside the facepiece is less than the air pressure outside the respirator during inhalation.

**NIOSH**

The National Institute for Occupational Safety and Health. NIOSH is the federal agency that certifies respirators for occupational use.

**Oxygen deficient**

An atmosphere with an oxygen content below 19.5% by volume.

**Permissible exposure limit (PEL)**

Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA chapters.

**Positive-pressure respirator**

A respirator in which the air pressure inside the respiratory-inlet covering is greater than the air pressure outside the respirator.

**Powered air-purifying respirators (PAPRs)**

An air-purifying respirator equipped with a blower that draws ambient air through cartridges or canisters. These respirators, as a group, are **NOT** classified as positive pressure respirators and must not be used as such.

**Pressure-demand respirator**

A positive-pressure atmosphere-supplying respirator that sends breathing air to the respiratory inlet covering when the positive pressure is reduced inside the facepiece by inhalation or leakage.

**Qualitative fit test (QLFT)**

A test that determines the adequacy of respirator fit for an individual. The test relies on the employee's ability to detect a test substance. Test results are either "pass" or "fail."

**Quantitative fit test (QNFT)**

A test that determines the adequacy of respirator fit for an individual. The test relies on specialized equipment that performs numeric measurements of leakage into the respiratory inlet covering. Test results are used to calculate a "fit factor."

**Respiratory hazard**

Harmful airborne hazards and oxygen deficiency that are addressed in WAC 296-307-624, Identifying and controlling airborne hazards and oxygen deficiency.

**Required use**

Respirator use:

- That is necessary to protect employees from respiratory hazards

**OR**

- That the employer decides to require for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits

- The employer for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits, **OR** the employer is required to follow a medical recommendation.

### **Respirator**

A type of personal protective equipment designed to protect the wearer from harmful airborne hazards, oxygen deficiency, or both.

### **Respiratory inlet covering**

The part of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source or both. The respiratory inlet covering may be a facepiece, helmet, hood, suit, or mouthpiece respirator with nose clamp.

### **Seal check**

Actions conducted by the respirator user each time the respirator is put on, to determine if the respirator is properly seated on the face.

### **Self-contained breathing apparatus (SCBA)**

An atmosphere-supplying respirator designed for the breathing air source, to be carried by the user.

### **Service-life**

The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer. For example, the period of time that sorbent cartridge is effective for removing a harmful substance from the air.

### **Sorbent**

Rigid, porous material, such as charcoal, used to remove vapor or gas from the air.

### **Supplied-air respirator (see air-line respirator)**

### **Tight-fitting facepiece**

A respiratory inlet covering forming a complete seal with the face **OR** neck. Mouthpiece respirators aren't tight-fitting facepieces.

### **Voluntary use**

Respirator use that is requested by the employee **AND** permitted by the employer when **NO** respiratory hazard exists.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-622, filed 12/21/04, effective 4/2/05.]

## **Part Y-6 Respiratory Hazards**

### **WAC 296-307-624 Scope.**

This part applies **only** if your employees:

- Are exposed to a respiratory hazard

**OR**

- Could be exposed to one of the specific hazards listed below.

This part applies to any workplace with potential or actual employee exposure to respiratory hazards. It requires you to protect employees from respiratory hazards by applying this protection strategy:

- Evaluate employee exposures to determine if controls are needed

[Title 296 WAC—p. 2608]

- Use feasible controls. For example, enclose or confine the operation, use ventilation systems, or substitute with less toxic material

- Use respirators if controls are not feasible or if they cannot completely remove the hazard.

### **Definition:**

### **Exposed or exposure:**

The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

**Note:** Examples of substances that may be respiratory hazards when airborne include:

- Chemicals listed in Table 3

- Any substance

- Listed in the latest edition of the NIOSH Registry of Toxic Effects of Chemical Substances

- For which positive evidence of an acute or chronic health hazard exists through tests conducted by, or known to, the employer

- That may pose a hazard to human health as stated on a material safety data sheet kept by, or known to, the employer

- Atmospheres considered oxygen deficient

- Biological agents such as harmful bacteria, viruses or fungi

- Examples include airborne TB aerosols and anthrax

- Pesticides with a label requirement for respirator use

- Chemicals used as crowd control agents such as pepper spray

- Chemicals present at clandestine drug labs.

These substances can be airborne as dusts, fibers, fogs, fumes, mists, gases, smoke, sprays, vapors, or aerosols.

- Substances in Table 3 that are marked with an X in the "skin" column may require personal protective equipment (PPE). See WAC 296-307-100, Personal protective equipment, for additional information and requirements.

- If any of the following hazards are present in your workplace, you will need both this part and any of the following specific rules that apply:

### **Hazard**

Acrylonitrile

Arsenic (inorganic)

Asbestos

Benzene

Butadiene

Cadmium

Carcinogens

Coke ovens

Cotton dust

1,2-Dibromo-3-

chloropropane

Ethylene oxide

Formaldehyde

Lead

Methylene chloride

Methylenedianiline

Thiram

Vinyl chloride

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-08-087, § 296-307-624, filed 4/4/06, effective 9/1/06; 05-01-166, § 296-307-624, filed 12/21/04, effective 4/2/05.]

## **WAC 296-307-626 Evaluate and control employee exposures.**

### **Summary:**

(2007 Ed.)

**Your responsibility:**

To protect your employees from exposure to respiratory hazards in the workplace by identifying and controlling the hazards.

**You must:**

Identify and evaluate employee exposures

WAC 296-307-62605

Control employee exposures

WAC 296-307-62610

Use respirators

WAC 296-307-62615

Notify employees

WAC 296-307-62620

Permissible exposure limits of air contaminants

WAC 296-307-62625.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-626, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62605 Identify and evaluate respiratory hazards.**

**You must:**

- Make sure employees are protected from potentially hazardous exposure while you perform your evaluation
- Perform your evaluation without considering the protection provided to employees by a respirator
- Determine the form of the hazard, such as dust, mist, gas, oxygen deficiency, or biological agent
- Make sure you consider:
  - Potential emergency and rescue situations that may occur, such as equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error
  - Workplace conditions such as work processes, types of material, control methods, work practices and environmental conditions.
- Determine or reasonably estimate whether any employee is or could be exposed to any of the following:
  - Any airborne substance above a permissible exposure limit (PEL) listed in Table 3
  - A substance at or above the action level (AL) specified in the rule for that substance
  - Any other respiratory hazard.
- Use **any** of the following to determine employee exposure:
  - Information that would allow an estimate of the level of employee exposure, such as MSDSs or pesticide labels, observations, measurements or calculations
  - Data demonstrating that a particular product, material or activity cannot result in employee exposure at or above the AL or PEL
  - Personal air samples that represent an employee's usual or worst case exposure for the entire shift.

**Note:**

- Rules for specific substances may contain additional requirements for determining employee exposure.
- Use methods of sampling and analysis that have been validated by the laboratory performing the analysis.
- Samples from a representative group of employees may be used for other employees performing the same work activities when the duration and level of exposure are similar.

**You must:**

- Consider the atmosphere to be immediately dangerous to life or health (IDLH) when you cannot determine or reasonably estimate employee exposure
- Make sure employee exposure, to 2 or more substances with additive health effects, is evaluated using this formula:

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

The symbol	Is the . . .
E	Equivalent exposure for the mixture. <b>When the value of E is greater than 1, a respiratory hazard is present.</b>
C	Concentration of a particular substance.
L	TWA, STEL, or ceiling for that substance from Table 3.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62605, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62610 Control employee exposures.**

**You must:**

- Use feasible controls to protect employees from exposure to respiratory hazards by:
  - Reducing employee exposure to a level that removes the respiratory hazard, such as to a level below the permissible exposure limit (PEL) in Table 3;
- OR**
- Reducing the exposure to the lowest achievable level, when the respiratory hazard cannot be removed.

**Note:** The following table gives you examples of control methods.

**Table 1  
Examples of Possible Controls**

Control:	For example:
Using a different chemical (substitution)	<ul style="list-style-type: none"> <li>• Choose a chemical with a lower evaporation rate or vapor pressure.</li> <li>• Choose a chemical without hazardous ingredients.</li> </ul>
Changing a process to lessen emissions	<ul style="list-style-type: none"> <li>• Use hand rolling or paint dipping instead of paint spraying.</li> <li>• Bolt items instead of welding them.</li> </ul>
Separating employees from emissions areas and sources	<ul style="list-style-type: none"> <li>• Use control rooms.</li> <li>• Build an enclosure around process machinery or other emissions sources.</li> <li>• Automate a process.</li> </ul>
Removing emissions at or near the source (local exhaust ventilation)	<ul style="list-style-type: none"> <li>• Install exhaust hoods or slots to capture emissions.</li> <li>• Use an exhausted enclosure (like a blasting cabinet or laboratory hood).</li> </ul>
Diluting and removing emissions in the work area (general exhaust ventilation)	<ul style="list-style-type: none"> <li>• Allow natural air movement to create an adequate airflow through an area.</li> <li>• Use mechanical fans.</li> </ul>

Control:	For example:
Modify work practices	<ul style="list-style-type: none"> <li>• Change the position of the worker relative to the work so fumes, vapors, or smoke do not go into their face.</li> </ul>
Rotate employees – Some specific rules prohibit the use of this control method	<ul style="list-style-type: none"> <li>• Move employees to another job that is without exposure, on a schedule to keep their total exposure below the permissible exposure limit.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62610, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62615 Use respirators.**

**You must:**

• Require employees to use respiratory protection when respiratory hazards have not been removed using feasible controls. For example, use respirators at any of the following times:

- While controls are being evaluated or put in place
- When the respiratory hazard is not completely removed
- When controls are **not** feasible.

**Reference:** See WAC 296-307-594, Respirators, for respirator program requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62615, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62620 Notify employees.**

**You must:**

• Notify employees who are or may be exposed to respiratory hazards, as specified in Table 2.

**Note:** • The notification may be provided either individually, to a group, or by posting of results in an appropriate location that's accessible to affected employees.

**Table 2  
Notification Requirements**

Notify employees of:	As follows:
Any exposure result above a permissible exposure limit (PEL)	Within five business days, after the employee's exposure result is known to the employer
The corrective action being taken to reduce employee exposure to or below the PEL AND The schedule for completion of the corrective action and any reasons why exposures cannot be lowered to below the PEL	Within fifteen business days, after the employee's exposure result is known to the employer
An exposure to these substances: • Acrylonitrile  • Arsenic (inorganic) • Asbestos • Benzene • Butadiene • Cadmium	In writing, as specified in the rule specific to the substance

Notify employees of:	As follows:
<ul style="list-style-type: none"> <li>• Coke oven emissions</li> <li>• Cotton dust</li> <li>• 1,2-Dibromo-3-chloropropane</li> <li>• Ethylene oxide</li> <li>• Formaldehyde</li> <li>• Lead</li> <li>• Methylene chloride</li> <li>• Methylenedianiline</li> <li>• Vinyl chloride</li> </ul>	

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-62620, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-62625 Permissible exposure limits of air contaminants.**

**IMPORTANT:**

The following information applies to Table 3, Permissible Exposure Limits for Air Contaminants.

• Exposure needs to be determined from personal air samples taken in the breathing zone or from monitoring representative of the employee's breathing zone.

• Ppm refers to parts of vapor or gas per million parts of air by volume, at 25 degrees C and 760 mm Hg pressure.

• Mg/m<sup>3</sup> refers to milligrams of substance per cubic meter of air.

• For a metal that is measured as the metal itself, only the CAS number for the metal is given. The CAS numbers for individual compounds of the metal are not provided. For more information about CAS registry numbers see the web site: <http://www.cas.org>.

• Time weighted averages (TWA<sub>8</sub>) represent the maximum allowed average exposure for any 8-hour time period. For work periods longer than 8 hours the TWA<sub>8</sub> needs to be determined using the 8 continuous hours with the highest average concentration.

• Short-term exposure limits (STEL) represent maximum allowed average exposure for any fifteen-minute period, unless another time period is noted in Table 3.

• The ceiling represents the maximum allowed exposure for the shortest time period that can feasibly be measured.

• An "X" in the "skin" column indicates the substance can be absorbed through the skin, either by airborne or direct contact.

• Requirements for the use of gloves, coveralls, goggles, and other personal protective equipment can be found in WAC 296-307-100.

• The respirable fraction of particulate is measured by sampling with a size-selector having the following characteristics:

Mean aerodynamic diameter in micrometers	Percent passing the selector
1	97
2	91
3	74
4	50
5	30
6	17
7	9
8	5
10	1

**Table 3 "Permissible Exposure Limits for Air Contaminants"**

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Abate (Temephos)	3383-96-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Acetaldehyde	75-07-0	100 ppm	150 ppm	—	—
Acetic acid	64-19-7	10 ppm	20 ppm	—	—
Acetic anhydride	108-24-7	—	—	5 ppm	—
Acetone	67-64-1	750 ppm	1,000 ppm	—	—
Acetonitrile	75-05-8	40 ppm	60 ppm	—	—
2-Acetylaminofluorene	53-96-3	—	—	—	—
Acetylene	74-86-2	Simple asphyxiant	—	—	—
Acetylene dichloride (1,2-Dichloroethylene)	540-59-0	200 ppm	250 ppm	—	—
Acetylene tetrabromide	79-27-6	1 ppm	3 ppm	—	—
Acetylsalicylic acid (Aspirin)	50-78-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Acrolein	107-02-8	0.1 ppm	0.3 ppm	—	—
Acrylamide	79-06-1	0.03 mg/m <sup>3</sup>	0.09 mg/m <sup>3</sup>	—	X
Acrylic acid	79-10-7	10 ppm	20 ppm	—	X
Acrylonitrile (Vinyl cyanide)	107-13-1	2 ppm	10 ppm	—	—
Aldrin	309-00-2	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Allyl alcohol	107-18-6	2 ppm	4 ppm	—	X
Allyl chloride	107-05-1	1 ppm	2 ppm	—	—
Allyl glycidyl ether (AGE)	106-92-3	5 ppm	10 ppm	—	—
Allyl propyl disulfide	2179-59-1	2 ppm	3 ppm	—	—
alpha-Alumina (Aluminum oxide)	1344-28-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Aluminum (as Al)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pyro powders	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Welding fumes	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Soluble salts	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Alkyls (NOC)	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Aluminum oxide (Alundum, Corundum)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
4-Aminodiphenyl	92-67-1	—	—	—	—
2-Aminoethanol (Ethanolamine)	141-43-5	3 ppm	6 ppm	—	—
2-Aminopyridine	504-29-0	0.5 ppm	1.5 ppm	—	—
Amitrole	61-82-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Ammonia	7664-41-7	25 ppm	35 ppm	—	—
Ammonium chloride, fume	12125-02-9	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Ammonium sulfamate (Ammate)	7773-06-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5.0 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
n-Amyl acetate	628-63-7	100 ppm	150 ppm	—	—
sec-Amyl acetate	626-38-0	125 ppm	156 ppm	—	—
Aniline and homologues	62-53-3	2 ppm	4 ppm	—	X
Anisidine (o, p-isomers)	29191-52-4	0.1 ppm	0.3 ppm	—	X
Antimony and compounds (as Sb)	7440-36-0	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
ANTU (alpha Naphthyl thiourea)	86-88-4	0.3 mg/m <sup>3</sup>	0.9 mg/m <sup>3</sup>	—	—
Argon	7440-37-1	Simple asphyxiant	—	—	—
Arsenic, organic compounds (as As)	7440-38-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Arsenic, inorganic compounds (as As) (when use is covered by WAC 296-62-07347)	7440-38-2	0.01 mg/m <sup>3</sup>	—	—	—
Arsenic, inorganic compounds (as As) (when use is not covered by WAC 296-62-07347)	7440-38-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Arsine	7784-42-1	0.05 ppm	0.15 ppm	—	—
Asbestos	—	—	—	—	—
Asphalt (Petroleum fumes)	8052-42-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Atrazine	1912-24-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Azinphos methyl (Guthion)	86-50-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Azodrin (Monocrotophos)	6923-22-4	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	—
Barium, soluble compounds (as Ba)	7440-39-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Barium sulfate	7727-43-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Baygon (Propoxur)	114-26-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Benomyl	17804-35-2	—	—	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Benzene	71-43-2	1 ppm	5 ppm	—	—
Benzdine	92-87-5	—	—	—	—
p-Benzoquinone (Quinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
Benzo(a) pyrene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Benzoyl peroxide	94-36-0	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Benzyl chloride	100-44-7	1ppm	3 ppm	—	—
Beryllium and beryllium compounds (as Be)	7440-41-7	0.002 mg/m <sup>3</sup>	0.005 mg/m <sup>3</sup> (30 min.)	0.025 mg/m <sup>3</sup>	—
Biphenyl (Diphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Bismuth telluride, undoped	1304-82-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Bismuth telluride, Se-doped	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Borates, tetra, sodium salts	—	—	—	—	—
Anhydrous	1330-43-4	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Decahydrate	1303-96-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentahydrate	12179-04-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Boron oxide	1303-86-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Boron tribromide	10294-33-4	—	—	1 ppm	—
Boron trifluoride	6737-07-2	—	—	1 ppm	—
Bromacil	314-40-9	1 ppm	3 ppm	—	—
Bromine	7726-95-6	0.1 ppm	0.3 ppm	—	—
Bromine pentafluoride	7789-30-2	0.1 ppm	0.3 ppm	—	—
Bromochloromethane (Chlorobromomthane)	74-97-5	200 ppm	250 ppm	—	—
Bromoform	15-25-2	0.5 ppm	1.5 ppm	—	X
Butadiene (1,3-butadiene)	106-99-0	1 ppm	5 ppm	—	—
Butane	106-97-8	800 ppm	1,000 ppm	—	—
Butanethiol (Butyl mercaptan)	109-79-5	0.5 ppm	1.5 ppm	—	—
2-Butanone (Methyl ethyl ketone)	78-93-3	200 ppm	300 ppm	—	—
2-Butoxy ethanol (Butyl cellosolve)	111-76-2	25 ppm	38 ppm	—	X
n-Butyl acetate	123-86-4	150 ppm	200 ppm	—	—
sec-Butyl acetate	105-46-4	200 ppm	250 ppm	—	—
tert-Butyl acetate	540-88-5	200 ppm	250 ppm	—	—
Butyl acrylate	141-32-2	10 ppm	20 ppm	—	—
n-Butyl alcohol	71-36-3	—	—	50 ppm	X
sec-Butyl alcohol	78-92-2	100 ppm	150 ppm	—	—
tert-Butyl alcohol	75-65-0	100 ppm	150 ppm	—	—
Butylamine	109-73-9	—	—	5 ppm	X
Butyl cellosolve (2-Butoxy ethanol)	111-76-2	25 ppm	38 ppm	—	—
tert-Butyl chromate (as CrOs)	1189-85-1	—	—	0.1 mg/m <sup>3</sup>	X
n-Butyl glycidyl ether (BGE)	2426-08-6	25 ppm	38 ppm	—	—
n-Butyl lactate	138-22-7	5 ppm	10 ppm	—	—
Butyl mercaptan	109-79-5	0.5 ppm	1.5 ppm	—	—
o-sec-Butylphenol	89-72-5	5 ppm	10 ppm	—	X
p-tert-Butyl-toluene	98-51-1	10 ppm	20 ppm	—	—
Cadmium oxide fume (as Cd)	1306-19-0	0.005 mg/m <sup>3</sup>	—	—	—
Cadmium dust and salts (as Cd)	7440-43-9	0.005 mg/m <sup>3</sup>	—	—	—
Calcium arsenate	—	0.01 mg/m <sup>3</sup>	—	—	—
Calcium carbonate	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium cyanamide	156-62-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Calcium hydroxide	1305-62-0	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium oxide	1305-78-8	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Calcium silicate	1344-95-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium sulfate	7778-18-9	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Camphor (synthetic)	76-22-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Caprolactam	105-60-2	—	—	—	—
Dust	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Vapor	—	5 ppm	10 ppm	—	—
Captafol (Difolatan)	2425-06-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Captan	133-06-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Carbaryl (Sevin)	63-25-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—

**Table 3 "Permissible Exposure Limits for Air Contaminants"**

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Carbofuran (Furadon)	1563-66-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Carbon black	1333-86-4	3.5 mg/m <sup>3</sup>	7 mg/m <sup>3</sup>	—	—
Carbon dioxide	124-38-9	5,000 ppm	30,000 ppm	—	—
Carbon disulfide	75-15-0	4 ppm	12 ppm	—	X
Carbon monoxide	630-08-0	35 ppm	200 ppm (5 min.)	1,500 ppm	—
Carbon tetrabromide	558-13-4	0.1 ppm	0.3 ppm	—	—
Carbon tetrachloride (Tetrachloromethane)	56-23-5	2 ppm	4 ppm	—	X
Carbonyl chloride (Phosgene)	7803-51-2	0.1 ppm	0.3 ppm	—	—
Carbonyl fluoride	353-50-4	2 ppm	5 ppm	—	—
Catechol (Pyrocatechol)	120-80-9	5 ppm	10 ppm	—	X
Cellosolve acetate (2-Ethoxyethylacetate)	111-15-9	5 ppm	10 ppm	—	X
Cellulose (paper fiber)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cesium hydroxide	21351-79-1	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Chlordane	57-74-9	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Chlorinated camphene (Toxaphen)	8001-35-2	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	—	X
Chlorinated diphenyl oxide	55720-99-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chlorine	7782-50-5	0.5 ppm	—	1 ppm	—
Chlorine dioxide	10049-04-4	0.1 ppm	0.3 ppm	—	—
Chlorine trifluoride	7790-91-2	—	—	0.1 ppm	—
Chloroacetaldehyde	107-20-0	—	—	1 ppm	—
a-Chloroacetophenone (Phenacyl chloride)	532-21-4	0.05 ppm	0.15 ppm	—	—
Chloroacetyl chloride	79-04-9	0.05 ppm	0.15 ppm	—	—
Chlorobenzene (Monochlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
o-Chlorobenzylidene malononitrile (OCBM)	2698-41-1	—	—	0.05 ppm	X
Chlorobromomethane	74-97-5	200 ppm	250 ppm	—	—
2-Chloro-1, 3-butadiene (beta-Chloroprene)	126-99-8	10 ppm	20 ppm	—	X
Chlorodifluoromethane	75-45-6	1,000 ppm	1,250 ppm	—	—
Chlorodiphenyl (42% Chlorine) (PCB) (Polychlorobiphenyls)	53469-21-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Chlorodiphenyl (54% Chlorine) (Polychlorobiphenyls (PCB))	11097-69-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
1-Chloro-2, 3-epoxypropane (Epichlorhydrin)	106-89-8	2 ppm	4 ppm	—	X
2-Chloroethanol (Ethylene chlorohydrin)	107-07-3	—	—	1 ppm	X
Chloroethylene (vinyl chloride)	75-01-4	1 ppm	5 ppm	—	—
Chloroform (Trichloromethane)	67-66-3	2 ppm	4 ppm	—	—
1-Chloro-1-nitropropane	600-25-9	2 ppm	4 ppm	—	—
bis-Chloromethyl ether	542-88-1	—	—	—	—
Chloromethyl methyl ether (Methyl chloromethyl ether)	107-30-2	—	—	—	—
Chloropentafluoroethane	76-15-3	1,000 ppm	1,250 ppm	—	—
Chloropicrin (Nitrotrichloromethane)	76-06-2	0.1 ppm	0.3 ppm	—	—
beta-Chloroprene (2-Chloro-1, 3-butadiene)	126-99-8	10 ppm	20 ppm	—	X
o-Chlorostyrene	2039-87-4	50 ppm	75 ppm	—	—
o-Chlorotoluene	95-49-8	50 ppm	75 ppm	—	—
2-Chloro-6-trichloromethyl pyridine (Nitrapyrin)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Chlorpyrifos	2921-88-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Chromic acid and chromates (as CrO <sub>3</sub> )	Varies with compound	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Chromium, soluble, chromic and chromous salts (as Cr)	7440-47-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chromium (VI) compounds (as Cr)	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Chromium metal and insoluble salts	7440-47-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chromyl chloride	14977-61-8	0.025 ppm	0.075 ppm	—	—
Chrysene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Clopidol	2971-90-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Coal dust (less than 5% SiO <sub>2</sub> ) Respirable fraction	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Coal dust (greater than or equal to 5% SiO <sub>2</sub> )	—	—	—	—	—
Respirable fraction	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Coal tar pitch volatiles (benzene soluble fraction) (Particulate polycyclic aromatic hydrocarbons)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Cobalt, metal fume & dust (as Co)	7440-48-4	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Cobalt carbonyl (as Co)	10210-68-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Cobalt hydrocarbonyl (as Co)	16842-03-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Coke oven emissions	—	0.15 mg/m <sup>3</sup>	—	—	—
Copper (as Cu)	7440-50-8	—	—	—	—
Fume	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Dusts and mists	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Cotton dust (raw) (waste sorting, blending, cleaning, willowing and garetting)	—	1 mg/m <sup>3</sup>	—	—	—
Corundum (Aluminum oxide)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Crag herbicide (Sesone, Sodium-2, 4-dichloro-phenoxyethyl sulfate)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cresol (all isomers)	1319-77-3	5 ppm	10 ppm	—	X
Crotonaldehyde	123-73-9; 4170-30-3	2 ppm	4 ppm	—	—
Crufomate	299-86-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cumene	98-82-8	50 ppm	75 ppm	—	X
Cyanamide	420-04-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Cyanide (as CN)	Varies with compound	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
Cyanogen	460-19-5	10 ppm	20 ppm	—	—
Cyanogen chloride	506-77-4	—	—	0.3 ppm	—
Cyclohexane	110-82-7	300 ppm	375 ppm	—	—
Cyclohexanol	108-93-0	50 ppm	75 ppm	—	X
Cyclohexanone	108-94-1	25 ppm	38 ppm	—	X
Cyclohexene	110-83-8	300 ppm	375 ppm	—	—
Cyclohexylamine	108-91-8	10 ppm	20 ppm	—	—
Cyclonite (RDX)	121-82-4	1.5 mg/m <sup>3</sup>	3.0 mg/m <sup>3</sup>	—	X
Cyclopentadiene	542-92-7	75 ppm	113 ppm	—	—
Cyclopentane	287-92-3	600 ppm	750 ppm	—	—
Cyhexatin (Tricyclohexyltin hydroxide)	13121-70-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
2,4-D (Dichlorophenoxy-acetic acid)	94-75-7	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
DBCP (1,2-Dibromo-3-chloropropane)	96-12-8	0.001 ppm	—	0.005 ppm	—
DDT (Dichlorodiphenyltri-chloroethane)	50-29-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
DDVP, (Dichlorvos)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dasanit (Fensulfthion)	115-90-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Decaborane	17702-41-9	0.05 ppm	0.15 ppm	—	X
Demeton	8065-48-3	0.01 ppm	0.03 ppm	—	X
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	50 ppm	75 ppm	—	—
1, 2-Diaminoethane (Ethylenediamine)	107-15-3	10 ppm	20 ppm	—	—
Diazinon	333-41-5	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Diazomethane	334-88-3	0.2 ppm	0.6 ppm	—	—
Diborane	19287-45-7	0.1 ppm	0.3 ppm	—	—
Dibrom (see Naled)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
1, 2-Dibromo-3-chloropropane (DBCP)	96-12-8	0.001 ppm	—	0.005 ppm	—
2-N-Dibutylamino ethanol	102-81-8	2 ppm	4 ppm	—	X
Dibutyl phosphate	107-66-4	1 ppm	2 ppm	—	—
Dibutyl phthalate	84-74-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dichloroacetylene	7572-29-4	—	—	0.1 ppm	—
o-Dichlorobenzene	95-50-1	—	—	50 ppm	—
p-Dichlorobenzene	106-46-7	75 ppm	110 ppm	—	—
3, 3'-Dichlorobenzidine	91-94-1	—	—	—	—
Dichlorodiphenyltri-chloroethane (DDT)	50-29-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Dichlorodifluoromethane	75-71-8	1,000 ppm	1,250 ppm	—	—
1, 3-Dichloro-5, 5-dimethyl hydantoin	118-52-5	0.2 mg/m <sup>3</sup>	0.4 mg/m <sup>3</sup>	—	—
1, 1-Dichloroethane (Ethylidene chloride)	75-34-3	100 ppm	150 ppm	—	—
1, 2-Dichloroethane (Ethylene dichloride)	107-06-2	1 ppm	2 ppm	—	—
1, 1-Dichloroethylene (Vinylidene chloride)	75-35-4	1 ppm	3 ppm	—	—

**Table 3 "Permissible Exposure Limits for Air Contaminants"**

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
1, 2-Dichloroethylene (Acetylene dichloride)	540-59-0	200 ppm	250 ppm	—	—
Dichloroethyl ether	111-44-4	5 ppm	10 ppm	—	X
Dichlorofluoromethane	75-43-4	10 ppm	20 ppm	—	—
Dichloromethane (Methylene chloride)	75-09-2	25 ppm	125 ppm	—	—
1, 1-Dichloro-1-nitroethane	594-72-9	2 ppm	10 ppm	—	—
Dichlorophenoxyacetic acid (2, 4-D)	94-75-7	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
1, 2-Dichloropropane (Propylene dichloride)	78-87-5	75 ppm	110 ppm	—	—
Dichloropropene	542-75-6	1 ppm	3 ppm	—	X
2, 2-Dichloropropionic acid	75-99-0	1 ppm	3 ppm	—	—
Dichlorotetrafluoroethane	76-14-2	1,000 ppm	1,250 ppm	—	—
Dichlorvos (DDVP)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dicrotophos	141-66-2	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Dicyclopentadiene	77-73-6	5 ppm	10 ppm	—	—
Dicyclopentadienyl iron	102-54-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dieldrin	60-57-1	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Diethanolamine	111-42-2	3 ppm	6 ppm	—	—
Diethylamine	109-89-7	10 ppm	25 ppm	—	—
2-Diethylaminoethanol	100-37-8	10 ppm	20 ppm	—	X
Diethylene triamine	111-40-0	1 ppm	3 ppm	—	X
Diethyl ether (Ethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Diethyl ketone	96-22-0	200 ppm	250 ppm	—	—
Diethyl phthalate	84-66-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Difluorodibromomethane	75-61-6	100 ppm	150 ppm	—	—
Difolatan (Captafol)	2425-06-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Diglycidyl ether (DGE)	2238-07-5	0.1 ppm	0.3 ppm	—	—
Dihydroxybenzene (Hydroquinone)	123-31-9	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Diisobutyl ketone (2, 6-Dimethylheptanone)	108-83-8	25 ppm	38 ppm	—	—
Diisopropylamine	108-18-9	5 ppm	10 ppm	—	X
Dimethoxymethane (Methylal)	109-87-5	1,000 ppm	1,250 ppm	—	—
Dimethyl acetamide	127-19-5	10 ppm	20 ppm	—	X
Dimethylamine	124-40-3	10 ppm	20 ppm	—	—
4-Dimethylaminoazo benzene	60-11-7	—	—	—	—
Dimethylaminobenzene (Xylidene)	1300-73-8	2 ppm	4 ppm	—	X
Dimethylaniline (N, N-Dimethylaniline)	121-69-7	5 ppm	10 ppm	—	X
Dimethylbenzene (Xylene)	1300-73-8	100 ppm	150 ppm	—	—
Dimethyl-1, 2-dibromo-2, 2-dichloroethyl phosphate (Naled)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Dimethylformamide	68-12-2	10 ppm	20 ppm	—	X
2, 6-Dimethylheptanone (Diisobutyl ketone)	108-83-8	25 ppm	38 ppm	—	—
1, 1-Dimethylhydrazine	57-14-7	0.5 ppm	1.5 ppm	—	X
Dimethyl phthalate	131-11-3	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dimethyl sulfate	77-78-1	0.1 ppm	0.3 ppm	—	X
Dinitolmide (3, 5-Dinitro-o-toluamide)	148-01-6	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dinitrobenzene (all isomers - alpha, meta and para)	528-29-0; 99-65-0; 100-25-4	0.15 ppm	0.45 ppm	—	X
Dinitro-o-cresol	534-52-1	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
3, 5-Dinitro-o-toluamide (Dinitolmide)	148-01-6	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dinitrotoluene	25321-14-6	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Dioxane (Diethylene dioxide)	123-91-1	25 ppm	38 ppm	—	X
Dioxathion	78-34-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Diphenyl (Biphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Diphenylamine	122-39-4	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Diphenylmethane diisocyanate (Methylene bisphenyl isocyanate (MDI))	101-68-8	—	—	0.02 ppm	—
Dipropylene glycol methyl ether	34590-94-8	100 ppm	150 ppm	—	X
Dipropyl ketone	123-19-3	50 ppm	75 ppm	—	—
Diquat	85-00-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Di-sec, Octyl phthalate (Di-2-ethylhexylphthalate)	117-81-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Disulfam	97-77-8	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Disulfoton	298-04-4	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
2, 6-Di-tert-butyl-p-cresol	128-37-0	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Diuron	330-54-1	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Divinyl benzene	1321-74-0	10 ppm	20 ppm	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Emery	12415-34-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Endosulfan (Thiodan)	115-29-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Endrin	72-20-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	106-89-8	2 ppm	4 ppm	—	X
EPN	2104-64-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
1, 2-Epoxypropane (Propylene oxide)	75-56-9	20 ppm	30 ppm	—	—
2, 3-Epoxy-1-propanol (Glycidol)	556-52-5	25 ppm	38 ppm	—	—
Ethane	—	Simple asphyxiant	—	—	—
Ethanthiol (Ethyl mercaptan)	75-08-1	0.5 ppm	1.5 ppm	—	—
Ethanol (Ethyl alcohol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethanolamine (2-Aminoethanol)	141-43-5	3 ppm	6 ppm	—	—
Ethion	563-12-2	0.4 mg/m <sup>3</sup>	1.2 mg/m <sup>3</sup>	—	X
2-Ethoxyethanol (Glycol monoethyl ether)	110-80-5	5 ppm	10 ppm	—	X
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	5 ppm	10 ppm	—	X
Ethyl acetate	141-78-6	400 ppm	500 ppm	—	—
Ethyl acrylate	140-88-5	5 ppm	25 ppm	—	X
Ethyl alcohol (ethanol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethylamine	75-04-07	10 ppm	20 ppm	—	—
Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl benzene	100-41-4	100 ppm	125 ppm	—	—
Ethyl bromide	74-96-4	200 ppm	250 ppm	—	—
Ethyl butyl ketone (3-Heptanone)	106-35-4	50 ppm	75 ppm	—	—
Ethyl chloride	75-00-3	1,000 ppm	1,250 ppm	—	—
Ethylene	74-85-1	Simple asphyxiant	—	—	—
Ethylene chlorohydrin (2-Chloroethanol)	107-07-3	—	—	1 ppm	X
Ethylenediamine (1,2-Diaminoethane)	107-15-3	10 ppm	20 ppm	—	X
Ethylene dibromide	106-93-4	0.1 ppm	0.5 ppm	—	—
Ethylene dichloride (1,2-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylene glycol	107-21-1	—	—	50 ppm	—
Ethylene glycol dinitrate	628-96-6	—	0.1 mg/m <sup>3</sup>	—	X
Ethylene glycol monomethyl ether acetate (Methyl cellosolve acetate)	—	5 ppm	10 ppm	—	X
Ethyleneimine	151-56-4	—	—	—	X
Ethylene oxide	75-21-8	1 ppm	5 ppm	—	—
Ethyl ether (Diethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Ethyl formate	109-94-4	100 ppm	125 ppm	—	—
Ethylidene chloride (1, 1-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylidene norbornene	16219-75-3	—	—	5.0 ppm	—
Ethyl mercaptan (Ethanethiol)	75-08-1	0.5 ppm	1.5 ppm	—	—
n-Ethylmorpholine	100-74-3	5 ppm	10 ppm	—	X
Ethyl sec-amyl ketone (5-methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl silicate	78-10-4	10 ppm	20 ppm	—	—
Fenamiphos	22224-92-6	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Fensulfothion (Dasanit)	115-90-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Fenthion	55-38-9	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Ferbam	—	—	—	—	—
Total particulate	14484-64-1	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Ferrovandium dust	12604-58-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Fluorides (as F)	Varies with compound	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Fluorine	7782-41-4	0.1 ppm	0.3 ppm	—	—
Fluorotrichloromethane (see Trichlorofluoro methane)	75-69-4	—	—	1,000 ppm	—
Fonofos	944-22-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Formaldehyde	50-00-0	2 ppm	2 ppm	—	—
Formamide	75-12-7	20 ppm	30 ppm	—	—
Formic acid	64-18-6	5 ppm	10 ppm	—	—
Furadon (carbofuran)	1563-66-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Furfural	98-01-1	2 ppm	4 ppm	—	X
Furfuryl alcohol	98-00-0	10 ppm	15 ppm	—	X
Gasoline	8006-61-9	300 ppm	500 ppm	—	—
Germanium tetrahydride	7782-65-2	0.2 ppm	0.6 ppm	—	—
Glass, fibrous or dust	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Gluteraldehyde	111-30-8	—	—	0.2 ppm	—
Glycerin mist	56-81-5	—	—	—	—

**Table 3 "Permissible Exposure Limits for Air Contaminants"**

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Glycidol (2, 3-Epoxy-1-propanol)	556-52-5	25 ppm	38 ppm	—	—
Glycol monoethyl ether (2-Ethoxyethanol)	110-80-5	5 ppm	10 ppm	—	X
Grain dust (oat, wheat, barley)	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Graphite, natural	7782-42-5	—	—	—	—
Respirable particulate	—	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Graphite, synthetic	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Guthion (Azinphosmethyl)	86-50-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Gypsum	13397-24-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Hafnium	7440-58-6	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Helium	—	Simple asphyxiant	—	—	—
Heptachlor	76-44-8	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Heptane (n-heptane)	142-82-5	400 ppm	500 ppm	—	—
2-Heptanone (Methyl n-amyl ketone)	110-43-0	50 ppm	75 ppm	—	—
3-Heptanone (Ethyl butyl ketone)	106-35-4	50 ppm	75 ppm	—	—
Hexachlorobutadiene	87-68-3	0.02 ppm	0.06 ppm	—	X
Hexachlorocyclopentadiene	77-47-4	0.01 ppm	0.03 ppm	—	—
Hexachloroethane	67-72-1	1 ppm	3 ppm	—	X
Hexachloronaphthalene	1335-87-1	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Hexafluoroacetone	684-16-2	0.1 ppm	0.3 ppm	—	X
Hexane	—	—	—	—	—
n-hexane	110-54-3	50 ppm	75 ppm	—	—
other isomers	Varies with compound	500 ppm	1,000 ppm	—	—
2-Hexanone (Methyl-n-butyl ketone)	591-78-6	5 ppm	10 ppm	—	—
Hexone (Methyl isobutyl ketone)	108-10-1	50 ppm	75 ppm	—	—
sec-Hexyl acetate	108-84-9	50 ppm	75 ppm	—	—
Hexylene glycol	107-41-5	—	—	25 ppm	—
Hydrazine	302-01-2	0.1 ppm	0.3 ppm	—	X
Hydrogen	—	Simple asphyxiant	—	—	—
Hydrogenated terphenyls	61788-32-7	0.5 ppm	1.5 ppm	—	—
Hydrogen bromide	10035-10-6	—	—	3.0 ppm	—
Hydrogen chloride	7647-01-0	—	—	5.0 ppm	—
Hydrogen cyanide	74-90-8	—	4.7 ppm	—	X
Hydrogen fluoride	7664-39-3	—	—	3 ppm	—
Hydrogen peroxide	7722-84-1	1 ppm	3 ppm	—	—
Hydrogen selenide (as Se)	7783-07-5	0.05 ppm	0.15 ppm	—	—
Hydrogen sulfide	7783-06-4	10 ppm	15 ppm	—	—
Hydroquinone (Dihydroxybenzene)	123-31-9	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	123-42-2	50 ppm	75 ppm	—	—
2-Hydroxypropyl acrylate	99-61-1	0.5 ppm	1.5 ppm	—	X
Indene	95-13-6	10 ppm	20 ppm	—	—
Indium and compounds (as In)	7440-74-6	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Iodine	7553-56-2	—	—	0.1 ppm	—
Iodoform	75-47-8	0.6 ppm	1.8 ppm	—	—
Iron oxide dust and fume (as Fe)	1309-37-1	—	—	—	—
Total particulate	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Iron pentacarbonyl (as Fe)	13463-40-6	0.1 ppm	0.2 ppm	—	—
Iron salts, soluble (as Fe)	Varies with compound	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Isoamyl acetate	123-92-2	100 ppm	150 ppm	—	—
Isoamyl alcohol (primary and secondary)	123-51-3	100 ppm	125 ppm	—	—
Isobutyl acetate	110-19-0	150 ppm	188 ppm	—	—
Isobutyl alcohol	78-83-1	50 ppm	75 ppm	—	—
Isooctyl alcohol	26952-21-6	50 ppm	75 ppm	—	X
Isophorone	78-59-1	4 ppm	—	5 ppm	—
Isophorone diisocyanate	4098-71-9	0.005 ppm	0.02 ppm	—	X
Isopropoxyethanol	109-59-1	25 ppm	38 ppm	—	—
Isopropyl acetate	108-21-4	250 ppm	310 ppm	—	—
Isopropyl alcohol	67-63-0	400 ppm	500 ppm	—	—
Isopropylamine	75-31-0	5 ppm	10 ppm	—	—
N-Isopropylaniline	768-52-5	2 ppm	4 ppm	—	X
Isopropyl ether	108-20-3	250 ppm	313 ppm	—	—
Isopropyl glycidyl ether (IGE)	4016-14-2	50 ppm	75 ppm	—	—
Kaolin	—	—	—	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Ketene	463-51-4	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Lannate (Methomyl)	16752-77-5	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Lead, inorganic (as Pb)	7439-92-1	0.05 mg/m <sup>3</sup>	—	—	—
Lead arsenate (as Pb)	3687-31-8	0.05 mg/m <sup>3</sup>	—	—	—
Lead chromate (as Pb)	7758-97-6	0.05 mg/m <sup>3</sup>	—	—	—
Limestone	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Lindane	58-89-9	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Lithium hydride	7580-67-8	0.025 mg/m <sup>3</sup>	0.075 mg/m <sup>3</sup>	—	—
L.P.G. (liquefied petroleum gas)	68476-85-7	1,000 ppm	1,250 ppm	—	—
Magnesite	546-93-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Magnesium oxide fume	1309-48-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Malathion	121-75-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	X
Maleic anhydride	108-31-6	0.25 ppm	0.75 ppm	—	—
Manganese and compounds (as Mn)	7439-96-5	—	—	5 mg/m <sup>3</sup>	—
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Manganese tetroxide and fume (as Mn)	7439-96-5	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Marble	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
MBOCA (4, 4'-Methylene bis (2-chloro-aniline))	101-14-4	—	—	—	X
MDA (4, 4-Methylene dianiline)	101-77-9	0.01 ppm	0.1 ppm	—	X
MDI (Methylene bisphenyl isocyanate) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
MEK (Methyl ethyl ketone) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
MEKP (Methyl ethyl ketone peroxide)	1338-23-4	—	—	0.2 ppm	—
Mercury (as Hg)	7439-97-6	—	—	—	—
Aryl and inorganic	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Organo-alkyl compounds	—	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>	—	X
Vapor	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	X
Mesityl oxide	141-79-7	15 ppm	25 ppm	—	—
Methacrylic acid	79-41-4	20 ppm	30 ppm	—	X
Methane	—	Simple asphyxiant	—	—	—
Methanethiol (Methyl mercaptan)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methanol (Methyl alcohol)	67-56-1	200 ppm	250 ppm	—	X
Methomyl (lannate)	16752-77-5	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Methoxychlor	72-43-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
2-Methoxyethanol (Methyl cellosolve)	109-86-4	5 ppm	10 ppm	—	X
2-Methoxyethyl acetate (Methyl cellosolve acetate)	110-49-6	5 ppm	10 ppm	—	X
4-Methoxyphenol	150-76-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Methyl acetate	79-20-9	200 ppm	250 ppm	—	—
Methyl acetylene (propyne)	74-99-7	1,000 ppm	1,250 ppm	—	—
Methyl acetylene-propadiene mixture (MAPP)	—	1,000 ppm	1,250 ppm	—	—
Methyl acrylate	96-33-3	10 ppm	20 ppm	—	X
Methylacrylonitrile	126-98-7	1 ppm	3 ppm	—	X
Methylal (Dimethoxy-methane)	109-87-5	1,000 ppm	1,250 ppm	—	—
Methyl alcohol (methanol)	67-56-1	200 ppm	250 ppm	—	X
Methylamine	74-89-5	10 ppm	20 ppm	—	—
Methyl amyl alcohol (Methyl isobutyl carbinol)	108-11-2	25 ppm	40 ppm	—	X
Methyl n-amyl ketone (2-Heptanone)	110-43-0	50 ppm	75 ppm	—	—
N-Methyl aniline (Monomethyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X
Methyl bromide	74-83-9	5 ppm	10 ppm	—	X
Methyl-n-butyl ketone (2-Hexanone)	591-78-6	5 ppm	10 ppm	—	—
Methyl cellosolve (2-Methoxyethanol)	109-86-4	5 ppm	10 ppm	—	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	5 ppm	10 ppm	—	X
Methyl chloride	74-87-3	50 ppm	100 ppm	—	—
Methyl chloroform (1, 1, 1-trichlorethane)	71-55-6	350 ppm	450 ppm	—	—
Methyl chloromethyl ether (chloromethyl methyl ether)	107-30-2	—	—	—	—
Methyl 2-cyanoacrylate	137-05-3	2 ppm	4 ppm	—	—
Methylcyclohexane	108-87-2	400 ppm	500 ppm	—	—
Methylcyclohexanol	25639-42-3	50 ppm	75 ppm	—	—
Methylcyclohexanone	583-60-8	50 ppm	75 ppm	—	X
Methylcyclopentadienyl manganese tricarbonyl (as Mn)	12108-13-3	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Methyl demeton	8022-00-2	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Methylene bisphenyl isocyanate (MDI) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
4, 4'-Methylene bis (2-chloro-aniline) (MBOCA)	101-14-4	—	—	—	X
Methylene bis (4-cyclohexylisocyanate)	5124-30-1	—	—	0.01 ppm	—
Methylene chloride (Dichloromethane)	75-09-2	25 ppm	125 ppm	—	—
4, 4'-Methylene dianiline (MDA)	101-77-9	0.01 ppm	0.1 ppm	—	X
Methyl ethyl ketone (MEK) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
Methyl ethyl ketone peroxide (MEKP)	1338-23-4	—	—	0.2 ppm	—
Methyl formate	107-31-3	100 ppm	150 ppm	—	—
5-Methyl-3-heptanone (Ethyl amyl ketone)	541-85-5	25 ppm	38 ppm	—	—
Methyl hydrazine (Monomethyl hydrazine)	60-34-4	—	—	0.2 ppm	X
Methyl iodide	74-88-4	2 ppm	4 ppm	—	X
Methyl isoamyl ketone	110-12-3	50 ppm	75 ppm	—	—
Methyl isobutyl carbinol (Methyl amyl alcohol)	108-11-2	25 ppm	40 ppm	—	X
Methyl isobutyl ketone (Hexone)	108-10-1	50 ppm	75 ppm	—	—
Methyl isocyanate	624-83-9	0.02 ppm	0.06 ppm	—	X
Methyl isopropyl ketone	563-80-4	200 ppm	250 ppm	—	—
Methyl mercaptan (Methanethiol)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methyl methacrylate	80-62-6	100 ppm	150 ppm	—	—
Methyl parathion	298-00-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Methyl propyl ketone (2-Pentanone)	107-87-9	200 ppm	250 ppm	—	—
Methyl silicate	684-84-5	1 ppm	3 ppm	—	—
alpha-Methyl styrene	98-83-9	50 ppm	100 ppm	—	—
Mevinphos (Phosdrin)	7786-34-7	0.01 ppm	0.03 ppm	—	X
Metribuzin	21087-64-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Mica (Silicates) Respirable fraction	12001-26-2	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Molybdenum (as Mo)	7439-98-7	—	—	—	—
Soluble compounds	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Monochlorobenzene (Chlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
Monocrotophos (Azodrin)	6923-22-4	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	—
Monomethyl aniline (N-Methyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X
Monomethyl hydrazine	—	—	—	0.2 ppm	—
Morpholine	110-91-8	20 ppm	30 ppm	—	X
Naled (Dibrom)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Naphtha	8030-30-6	100 ppm	150 ppm	—	X
Naphthalene	91-20-3	10 ppm	15 ppm	—	—
alpha-Naphthylamine	134-32-7	—	—	—	—
beta-Naphthylamine	91-59-8	—	—	—	—
Neon	7440-01-9	Simple asphyxiant	—	—	—
Nickel carbonyl (as Ni)	13463-39-3	0.001 ppm	0.003 ppm	—	—
Nickel (as Ni)	7440-02-0	—	—	—	—
Metal and insoluble compounds	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Soluble compounds	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Nicotine	54-11-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Nitrapyrin (2-Chloro-6 trichloromethyl pyridine)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Nitric acid	7697-37-2	2 ppm	4 ppm	—	—
Nitric oxide	10102-43-9	25 ppm	38 ppm	—	—
p-Nitroaniline	100-01-6	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Nitrobenzene	98-95-3	1 ppm	3 ppm	—	X
4-Nitrobiphenyl	92-93-3	—	—	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
p-Nitrochlorobenzene	100-00-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
4-Nitrodiphenyl	—	—	—	—	—
Nitroethane	79-24-3	100 ppm	150 ppm	—	—
Nitrogen	7727-37-9	Simple asphyxiant	—	—	—
Nitrogen dioxide	10102-44-0	—	1 ppm	—	—
Nitrogen oxide (Nitrous oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nitrogen trifluoride	7783-54-2	10 ppm	20 ppm	—	—
Nitroglycerin	55-63-0	—	0.1 mg/m <sup>3</sup>	—	X
Nitromethane	75-52-5	100 ppm	150 ppm	—	—
1-Nitropropane	108-03-2	25 ppm	38 ppm	—	—
2-Nitropropane	79-46-9	10 ppm	20 ppm	—	—
N-Nitrosodimethylamine	62-75-9	—	—	—	—
Nitrotoluene	—	—	—	—	—
o-isomer	88-72-2	2 ppm	4 ppm	—	X
m-isomer	98-08-2	2 ppm	4 ppm	—	X
p-isomer	99-99-0	2 ppm	4 ppm	—	X
Nitrotrichloromethane (Chloropicrin)	76-06-2	0.1 ppm	0.3 ppm	—	—
Nitrous oxide (Nitrogen oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nonane	111-84-2	200 ppm	250 ppm	—	—
Octachloronaphthalene	2234-13-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Octane	111-65-9	300 ppm	375 ppm	—	—
Oil mist mineral (particulate)	8012-95-1	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Osmium tetroxide (as Os)	20816-12-0	0.0002 ppm	0.0006 ppm	—	—
Oxalic acid	144-62-7	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	—	—
Oxygen difluoride	7783-41-7	—	—	0.05 ppm	—
Ozone	10028-15-6	0.1 ppm	0.3 ppm	—	—
Paper fiber (Cellulose)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Paraffin wax fume	8002-74-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Paraquat	—	—	—	—	—
Respirable fraction	4685-14-7 1910-42-5 2074-50-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Parathion	56-38-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Particulate polycyclic aromatic hydrocarbons (benzene soluble fraction) (coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Particulates not otherwise regulated	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentaborane	19624-22-7	0.005 ppm	0.015 ppm	—	—
Pentachloronaphthalene	1321-64-8	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Pentachlorophenol	87-86-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Pentaerythritol	115-77-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentane	109-66-0	600 ppm	750 ppm	—	—
2-Pentanone (methyl propyl ketone)	107-87-9	200 ppm	250 ppm	—	—
Perchloroethylene (tetrachloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Perchloromethyl mercaptan	594-42-3	0.1 ppm	0.3 ppm	—	—
Perchloryl fluoride	7616-94-6	3 ppm	6 ppm	—	—
Perlite	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Petroleum distillates (Naptha, rubber solvent)	—	100 ppm	150 ppm	—	—
Phenacyl chloride (a-Chloroacetophenone)	532-21-4	0.05 ppm	0.15 ppm	—	—
Phenol	108-95-2	5 ppm	10 ppm	—	X
Phenothiazine	92-84-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
p-Phenylene diamine	106-50-3	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Phenyl ether (vapor)	101-84-8	1 ppm	3 ppm	—	—
Phenyl ether-diphenyl mixture (vapor)	—	1 ppm	3 ppm	—	—
Phenylethylene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Phenyl glycidyl ether (PGE)	122-60-1	1 ppm	3 ppm	—	—
Phenylhydrazine	100-63-0	5 ppm	10 ppm	—	X
Phenyl mercaptan	108-98-5	0.5 ppm	1.5 ppm	—	—
Phenylphosphine	638-21-1	—	—	0.05 ppm	—
Phorate	298-02-2	0.05 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	—	X
Phosdrin (Mevinphos)	7786-34-7	0.01 ppm	0.03 ppm	—	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Phosgene (carbonyl chloride)	75-44-5	0.1 ppm	0.3 ppm	—	—
Phosphine	7803-51-2	0.3 ppm	1 ppm	—	—
Phosphoric acid	7664-38-2	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Phosphorus (yellow)	7723-14-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Phosphorous oxychloride	10025-87-3	0.1 ppm	0.3 ppm	—	—
Phosphorus pentachloride	10026-13-8	0.1 ppm	0.3 ppm	—	—
Phosphorus pentasulfide	1314-80-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Phosphorus trichloride	12-2-19	0.2 ppm	0.5 ppm	—	—
Phthalic anhydride	85-44-9	1 ppm	3 ppm	—	—
m-Phthalodinitrile	626-17-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Picloram	1918-02-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Picric acid (2, 4, 6-Trinitrophenol)	88-89-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Pindone	—	—	—	—	—
(2-Pivalyl-1, 3-indandione, Pival)	83-26-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Piperazine dihydrochloride	142-64-3	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pival (Pindone)	83-26-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Plaster of Paris	26499-65-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Platinum (as Pt)	7440-06-4	—	—	—	—
Metal	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Soluble salts	—	0.002 mg/m <sup>3</sup>	0.006 mg/m <sup>3</sup>	—	—
Polychlorobiphenyls (Chlorodiphenyls)	—	—	—	—	—
42% Chlorine (PCB)	53469-21-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
54% Chlorine (PCB)	11097-69-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Portland cement	65997-15-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Potassium hydroxide	1310-58-3	—	—	2 mg/m <sup>3</sup>	—
Propane	74-98-6	1,000 ppm	1,250 ppm	—	—
Propargyl alcohol	107-19-7	1 ppm	3 ppm	—	X
beta-Propiolactone	57-57-8	—	—	—	—
Propionic acid	79-09-4	10 ppm	20 ppm	—	—
Propoxur (Baygon)	114-26-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
n-Propyl acetate	109-60-4	200 ppm	250 ppm	—	—
n-Propyl alcohol	71-23-8	200 ppm	250 ppm	—	X
n-Propyl nitrate	627-13-4	25 ppm	40 ppm	—	—
Propylene	—	Simple asphyxiant	—	—	—
Propylene dichloride (1, 2-Dichloropropane)	78-87-5	75 ppm	110 ppm	—	—
Propylene glycol dinitrate	6423-43-4	0.05 ppm	0.15 ppm	—	X
Propylene glycol monomethyl ether	107-98-2	100 ppm	150 ppm	—	—
Propylene imine	75-55-8	2 ppm	4 ppm	—	X
Propylene oxide (1,2-Epoxypropane)	75-56-9	20 ppm	30 ppm	—	—
Propyne (Methyl acetylene)	74-99-7	1,000 ppm	1,250 ppm	—	—
Pyrethrum	8003-34-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pyridine	110-86-1	5 ppm	10 ppm	—	—
Pyrocatechol (Catechol)	120-80-9	5 ppm	10 ppm	—	X
Quinone (p-Benzoquinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
RDX (Cyclonite)	—	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Resorcinol	108-46-3	10 ppm	20 ppm	—	—
Rhodium (as Rh)	7440-16-6	—	—	—	—
Insoluble compounds, metal fumes and dusts	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Soluble compounds, salts	—	0.001 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>	—	—
Ronnel	299-84-3	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Rosin core solder, pyrolysis products (as formaldehyde)	8050-09-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Rotenone	83-79-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Rouge	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Rubber solvent (naphtha)	8030-30-6	100 ppm	150 ppm	—	—
Selenium compounds (as Se)	7782-49-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Selenium hexafluoride (as Se)	7783-79-1	0.05 ppm	0.15 ppm	—	—
Sesone (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sevin (Carbaryl)	63-25-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silane (see Silicon tetrahydride)	7803-62-5	5 ppm	10 ppm	—	—
Silica, amorphous, precipitated and gel	112926-00-8	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica	61790-53-2	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Silica, crystalline cristobalite	—	—	—	—	—
Respirable fraction	14464-46-1	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Silica, crystalline quartz	—	—	—	—	—
Respirable fraction	14808-60-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silica, crystalline tripoli (as quartz)	—	—	—	—	—
Respirable fraction	1317-95-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silica, crystalline tridymite	—	—	—	—	—
Respirable fraction	15468-32-3	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Silica, fused	—	—	—	—	—
Respirable fraction	60676-86-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silicates (less than 1% crystalline silica)	—	—	—	—	—
Mica	—	—	—	—	—
Respirable fraction	12001-26-2	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Talc (containing asbestos)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tremolite	—	—	—	—	—
Silicon	7440-21-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silicon carbide	409-21-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silicon tetrahydride (Silane)	7803-62-5	5 ppm	10 ppm	—	—
Silver, metal dust and soluble compounds (as Ag)	7440-22-4	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Sodium azide (as HN <sub>3</sub> or NaN <sub>3</sub> )	26628-22-8	—	—	0.1 ppm	X
Sodium bisulfite	7631-90-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sodium-2, 4-dichloro-phenoxyethyl sulfate (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sodium fluoroacetate	62-74-8	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	X
Sodium hydroxide	1310-73-2	—	—	2 mg/m <sup>3</sup>	—
Sodium metabisulfite	7681-57-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Starch	9005-25-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Stibine	7803-52-3	0.1 ppm	0.3 ppm	—	—
Stoddard solvent	8052-41-3	100 ppm	150 ppm	—	—
Strychnine	57-24-9	0.15 mg/m <sup>3</sup>	0.45 mg/m <sup>3</sup>	—	—
Styrene (Phenylethylene, Vinyl benzene)	100-42-5	50 ppm	100 ppm	—	—
Subtilisins	9014-01-1	—	0.00006 mg/m <sup>3</sup> (60 min.)	—	—
Sucrose	57-50-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sulfotep (TEDP)	3689-24-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Sulfur dioxide	7446-09-5	2 ppm	5 ppm	—	—
Sulfur hexafluoride	2551-62-4	1,000 ppm	1,250 ppm	—	—
Sulfuric acid	7664-93-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Sulfur monochloride	10025-67-9	—	—	1 ppm	—
Sulfur pentafluoride	5714-22-1	—	—	0.01 ppm	—
Sulfur tetrafluoride	7783-60-0	—	—	0.1 ppm	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Sulfuryl fluoride	2699-79-8	5 ppm	10 ppm	—	—
Sulprofos	35400-43-2	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Systox (Demeton)	8065-48-3	0.01 ppm	0.03 ppm	—	X
2, 4, 5-T	93-76-5	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Talc (containing asbestos)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tantalum	—	—	—	—	—
Metal and oxide dusts	7440-25-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
TDI	—	—	—	—	—
(Toluene-2, 4-diisocyanate)	584-84-9	0.005 ppm	0.02 ppm	—	—
TEDP (Sulfotep)	3689-24-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Tellurium and compounds (as Te)	13494-80-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Tellurium hexafluoride (as Te)	7783-80-4	0.02 ppm	0.06 ppm	—	—
Temephos (Abate)	3383-96-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
TEPP	107-49-3	0.004 ppm	0.012 ppm	—	X
Terphenyls	26140-60-3	—	—	0.5 ppm	—
1, 1, 1, 2-Tetrachloro-2, 2-difluoroethane	76-11-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloro-1, 2-difluoroethane	76-12-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloroethane	79-34-5	1 ppm	3 ppm	—	X
Tetrachloroethylene	—	—	—	—	—
(Perchloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Tetrachloromethane	—	—	—	—	—
(Carbon tetrachloride)	56-23-5	2 ppm	4 ppm	—	X
Tetrachloronaphthalene	1335-88-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	X
Tetraethyl lead (as Pb)	78-00-2	0.075 mg/m <sup>3</sup>	0.225 mg/m <sup>3</sup>	—	X
Tetrahydrofuran	109-99-9	200 ppm	250 ppm	—	—
Tetramethyl lead (as Pb)	75-74-1	0.075 mg/m <sup>3</sup>	0.225 mg/m <sup>3</sup>	—	X
Tetramethyl succinonitrile	3333-52-6	0.5 ppm	1.5 ppm	—	X
Tetranitromethane	509-14-8	1 ppm	3 ppm	—	—
Tetrasodium pyrophosphate	7722-88-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Tetryl (2, 4, 6-trinitrophenyl-methylnitramine)	479-45-8	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Thallium (soluble compounds) (as Tl)	7440-28-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
4, 4-Thiobis	—	—	—	—	—
(6-tert-butyl-m-cresol)	96-69-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Thiodan (Endosulfan)	115-29-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Thioglycolic acid	68-11-1	1 ppm	3 ppm	—	X
Thionyl chloride	7719-09-7	—	—	1 ppm	—
Thiram	137-26-8	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Tin (as Sn)	—	—	—	—	—
Inorganic compounds	7440-31-5	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Organic compounds	7440-31-5	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Tin oxide (as Sn)	21651-19-4	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Titanium dioxide	13463-67-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
TNT (2, 4, 6-Trinitrotoluene)	118-96-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Toluene	108-88-3	100 ppm	150 ppm	—	—
Toluene-2, 4-diisocyanate (TDI)	584-84-9	0.005 ppm	0.02 ppm	—	—
m-Toluidine	108-44-1	2 ppm	4 ppm	—	X
o-Toluidine	95-53-4	2 ppm	4 ppm	—	X
p-Toluidine	106-49-0	2.0 ppm	4 ppm	—	X
Toxaphene (Chlorinated camphene)	8001-35-2	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	—	X
Tremolite	—	—	—	—	—
Tributyl phosphate	126-73-8	0.2 ppm	0.6 ppm	—	—
Trichloroacetic acid	76-03-9	1 ppm	3 ppm	—	—
1, 2, 4-Trichlorobenzene	120-82-1	—	—	5 ppm	—
1, 1, 1-Trichloroethane	—	—	—	—	—
(Methyl chloroform)	71-55-6	350 ppm	450 ppm	—	—
1, 1, 2-Trichloroethane	79-00-5	10 ppm	20 ppm	—	—
Trichloroethylene	79-01-6	50 ppm	200 ppm	—	—
Trichlorofluoromethane	—	—	—	—	—
(Fluorotrichloromethane)	75-69-4	—	—	1,000 ppm	—
Trichloromethane (Chloroform)	67-66-3	2 ppm	4 ppm	—	—
Trichloronaphthalene	1321-65-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
1, 2, 3-Trichloropropane	96-18-4	10 ppm	20 ppm	—	X
1, 1, 2-Trichloro-1, 2, 2-trifluoroethane	76-13-1	1,000 ppm	1,250 ppm	—	—
Tricyclohexyltin hydroxide (Cyhexatin)	13121-70-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Triethylamine	121-44-8	10 ppm	15 ppm	—	—
Trifluorobromomethane	75-63-8	1,000 ppm	1,250 ppm	—	—
Trimellitic anhydride	552-30-7	0.005 ppm	0.015 ppm	—	—
Trimethylamine	75-50-3	10 ppm	15 ppm	—	—
Trimethyl benzene	25551-13-7	25 ppm	38 ppm	—	—
Trimethyl phosphite	121-45-9	2 ppm	4 ppm	—	—
2, 4, 6-Trinitrophenol (Picric acid)	88-89-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
2, 4, 6-Trinitrophenyl-methylnitramine (Tetryl)	479-45-8	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
2, 4, 6-Trinitrotoluene (TNT)	118-96-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Triorthocresyl phosphate	78-30-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Triphenyl amine	603-34-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Triphenyl phosphate	115-86-6	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Tungsten (as W)	7440-33-7	—	—	—	—
Soluble compounds	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Turpentine	8006-64-2	100 ppm	150 ppm	—	—
Uranium (as U)	7440-61-1	—	—	—	—
Soluble compounds	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
n-Valeraldehyde	110-62-3	50 ppm	75 ppm	—	—
Vanadium (as V2O5)	—	—	—	—	—
Respirable fraction	1314-62-1	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Vegetable oil mist	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Vinyl acetate	108-05-1	10 ppm	20 ppm	—	—
Vinyl benzene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Vinyl bromide	593-60-2	5 ppm	10 ppm	—	—
Vinyl chloride (Chloroethylene)	75-01-4	1 ppm	5 ppm	—	—
Vinyl cyanide (Acrylonitrile)	107-13-1	2 ppm	10 ppm	—	—
Vinyl cyclohexene dioxide	106-87-6	10 ppm	20 ppm	—	X
Vinyl toluene	25013-15-4	50 ppm	75 ppm	—	—
Vinylidene chloride (1, 1-Dichloroethylene)	75-35-4	1 ppm	3 ppm	—	—
VM & P Naphtha	8032-32-4	300 ppm	400 ppm	—	—
Warfarin	81-81-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Welding fumes (total particulate)	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Wood dust	—	—	—	—	—
Nonallergenic; (All woods except allergenics)	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Allergenics (e.g. cedar, mahogany and teak)	—	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Xylenes (ortho, meta, and para isomers) (Dimethylbenzene)	1330-20-7	100 ppm	150 ppm	—	—
m-Xylene alpha, alpha-diamine	1477-55-0	—	—	0.1 mg/m <sup>3</sup>	X
Xylidine (Dimethylaminobenzene)	1300-73-8	2 ppm	4 ppm	—	X
Yttrium	7440-65-5	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Zinc chloride fume	7646-85-7	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	—	—
Zinc chromate (as CrO3)	Varies with compound	0.05 mg/m <sup>3</sup>	—	0.1 mg/m <sup>3</sup>	—
Zinc oxide	1314-13-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zinc oxide fume	1314-13-2	5 mg/g <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zinc stearate	557-05-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zirconium compounds (as Zr)	7440-67-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-08-087, § 296-307-62625, filed 4/4/06, effective 9/1/06; 05-01-166, § 296-307-62625, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-628 Definitions.**

**Ceiling** - An exposure limit, measured over the shortest time period feasible, that must not be exceeded during any part of the employee's workday.

**Dust** - Solid particles suspended in air. Dusts are generated by handling, drilling, crushing, grinding, rapid impact, detonation, or decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, grain, etc.

**Exposed or exposure** - The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

**Fume** - Solid particles suspended in air, generated by condensation from the gaseous state, generally after volatilization from molten metals, etc.

**Gas** - A normally formless fluid which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.

**Mist** - Liquid droplets suspended in air, generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming, spraying or atomizing.

**Oxygen deficient** - An atmosphere with an oxygen content below 19.5% by volume.

**Permissible exposure limits (PEL)** - Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA rules.

**Short-term exposure limit (STEL)** - An exposure limit averaged over a short time period (usually measured for 15 minutes) that must not be exceeded during any part of an employee's workday.

**Time weighted average (TWA<sub>8</sub>)** - An exposure limit averaged over 8 hours that must not be exceeded during an employee's workday.

**Toxic substance** - Any chemical substance or biological agent, such as bacteria, virus, and fungus, which is any of the following:

- Listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS)
- Shows positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer.

The subject of a material safety data sheet kept by or known to the employer showing the material may pose a hazard to human health.

**Vapor** - The gaseous form of a substance that is normally in the solid or liquid state.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-628, filed 12/21/04, effective 4/2/05.]

- These goals are accomplished by:
- Measuring and computing the employee noise exposure from all equipment and machinery in the workplace, as well as any other noise sources in the work area
  - Protecting employees from noise exposure by using feasible noise controls
  - Making sure employees use hearing protection, if you cannot feasibly control the noise
  - Training employees about hearing loss prevention
  - Evaluating your hearing loss prevention efforts by tracking employee hearing or periodically reviewing controls and protection
  - Making appropriate corrections to your program.

**Reference:** Table 1 will help you determine the hearing loss prevention requirements for your workplace. For the specific requirements associated with Noise Evaluation Criteria, see WAC 296-307-63410 of this part.

**Table 1  
Noise Evaluation Criteria**

Criteria	Description	Requirements
85 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	– Hearing protection – Training – Audiometric testing
90 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	– Noise controls <b>AND</b> – Hearing protection – Training – Audiometric testing
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	– Hearing protection – Signs posted in work areas warning of exposure
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-630, filed 12/21/04, effective 4/2/05.]

**Hearing Loss Prevention Program**

**WAC 296-307-632 Summary.**

**Your responsibility:**

To prevent employee hearing loss by minimizing, and providing protection from, noise exposures.

**You must:**

Conduct employee noise exposure monitoring  
WAC 296-307-63205

**Part Y-7  
Hearing Loss Prevention (Noise)**

**WAC 296-307-630 Scope.** The purpose of this part is to:

- Prevent employee hearing loss by minimizing employee noise exposures
- AND**
- Make sure employees exposed to noise are protected.

Control employee noise exposures that equal or exceed 90 dBA TWA<sub>8</sub>

WAC 296-307-63210

Make sure employees use hearing protection when their noise exposure equals or exceeds 85 dBA TWA<sub>8</sub>

WAC 296-307-63215

Make sure exposed employees receive training about noise and hearing protection

WAC 296-307-63220

Make sure warning signs are posted for areas with noise levels that equal or exceed 115 dBA

WAC 296-307-63225

Arrange for oversight of audiometric testing

WAC 296-307-63230

Identify and correct deficiencies in your hearing loss prevention program

WAC 296-307-63235

Document your hearing loss prevention activities

WAC 296-307-63240.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-632, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-63205 Conduct employee noise exposure monitoring.**

#### **You must:**

- Conduct employee noise exposure monitoring to determine the employee's actual exposure when reasonable information indicates that any employee's exposure may equal or exceed 85 dBA TWA<sub>8</sub>.

**Note:**

- Representative monitoring may be used where several employees perform the same tasks in substantially similar conditions
- Examples of information or situations that can indicate exposures which equal or exceed 85 dBA TWA<sub>8</sub>, include:
  - Noise in the workplace that interferes with people speaking, even at close range
  - Information from the manufacturer of equipment you use in the workplace that indicates high noise levels for machines in use
  - Reports from employees of ringing in their ears or temporary hearing loss
  - Warning signals or alarms that are difficult to hear
  - Work near abrasive blasting or jack hammering operations
  - Use of tools and equipment such as the following:
    - Heavy equipment or machinery
    - Fuel-powered hand tools
    - Compressed air-driven tools or equipment in frequent use
    - Power saws, grinders or chippers
    - Powder-actuated tools.

#### **You must:**

- Follow applicable guidance in WAC 296-307-634 when conducting noise exposure monitoring
- Make sure your sampling for noise exposure monitoring identifies:
  - All employees whose exposure equals or exceeds the following:
    - 85 dBA TWA<sub>8</sub> (noise dosimetry, providing an average exposure over an eight-hour time period)
    - 115 dBA (slow response sound level meter, identifying short-term noise exposures)
    - 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).
  - Exposure levels for selection of hearing protection.

[Title 296 WAC—p. 2626]

- Provide exposed employees and their representatives with an opportunity to observe any measurements of employee noise exposure that are conducted

- Notify each employee whose exposure equals or exceeds 85 dBA TWA<sub>8</sub> of the monitoring results within five working days of when you receive the results

- Conduct additional noise monitoring whenever a change in production, process, equipment or controls, may reasonably be expected to result in:
  - Additional employees whose exposure equals or exceeds 85 dBA TWA<sub>8</sub>
  - Employees exposed to higher level of noise requiring more effective hearing protection.

**Note:** Conditions that may be expected to increase exposure include:

- Adding machinery to the work area
- Increasing production rates
- Removal or deterioration of noise control devices
- Increased use of noisy equipment
- Change in work schedule
- Change of job duties.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63205, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-63210 Control employee noise exposures that equal or exceed 90 dBA TWA<sub>8</sub>.**

#### **IMPORTANT:**

Hearing protection provides a barrier to noise and protects employees but is not considered a control of the noise hazard. Separate requirements apply to hearing protection and are found in WAC 296-307-63215.

#### **You must:**

- Reduce employee noise exposure, using feasible controls, wherever exposure equals or exceeds 90 dBA TWA<sub>8</sub>.

**Note:**

- Once noise exposures are brought below 90 dBA TWA<sub>8</sub>, no further reduction is required. However, further reduction of noise may reduce the need for other hearing loss prevention requirements
- Controls that eliminate noise at the source or establish a permanent barrier to noise are typically more reliable. For example:
  - Replacing noisy equipment with quiet equipment
  - Using silencers and mufflers
  - Installing enclosures
  - Damping noisy equipment and parts.
- Other controls and work practices may also be useful for reducing noise exposures. Examples include:
  - Employee rotation
  - Limiting use of noisy equipment
  - Rescheduling work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63210, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-63215 Make sure employees use hearing protection when their noise exposure equals or exceeds 85 dBA TWA<sub>8</sub>.**

#### **You must:**

- Make sure employees wear hearing protectors that will provide sufficient protection when exposure equals or exceeds:
  - 85 dBA TWA<sub>8</sub> (noise dosimetry, providing an average exposure over an eight-hour time period)
  - 115 dBA (slow response sound level meter, identifying short-term noise exposures)
  - 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).

(2007 Ed.)

- Provide employees with an appropriate selection of hearing protectors:

- The selection must include at least two distinct types (such as molded earplugs, foam earplugs, custom-molded earplugs, earcaps, or earmuffs) for each exposed employee and must be sufficient to cover:

- Different levels of hearing protection needed in order to reduce all employee exposures to a level below 85 dBA TWA<sub>8</sub>

- Different sizes
    - Different working conditions.
  - Consider requests of the employees regarding:
    - Physical comfort
    - Environmental conditions
    - Medical needs
    - Communication requirements.

**Note:** Hearing protector selection should include earplugs, earcaps and earmuffs.

**You must:**

- Provide hearing protection at no cost to employees
- Supervise employees to make sure that hearing protection is used correctly

- Make sure hearing protectors are:
  - Properly chosen for fit
  - Replaced as necessary.

- Make sure all hearing protection is sufficient to reduce the employee's equivalent eight-hour noise exposure to 85 dBA or less. When using the A-weighted exposure measurements, reported as "dBA TWA<sub>8</sub>," the reduction in noise exposure by hearing protectors is given by Table 2:

**Table 2**

**Effective Protection of Hearing Protectors**

Type of hearing protection	Effective protection
Single hearing protection (earplugs, earcaps or earmuffs)	7 dB less than the manufacturer assigned noise reduction rating (NRR); for example, earplugs with an NRR of 20 dB are considered to reduce employee exposures of 95 dBA TWA <sub>8</sub> to 82 dBA TWA <sub>8</sub>
Dual hearing protection (earplug and earmuff worn together)	2 dB less than the higher NRR of the two protectors; for example, earplugs with an NRR of 20 dB and earmuffs with an NRR of 12 dB are considered to reduce employee exposures of 100 dBA TWA <sub>8</sub> to 82 dBA TWA <sub>8</sub>

- In addition to protection based on daily noise dose, make sure hearing protection has an NRR of at least 20 dB when exposures involve noise that equals or exceeds 115 dBA (slow response sound level meter) or 140 dBC (fast response sound level meter).

**Note:** You may also evaluate hearing protection by using the other methods given in the NIOSH *Compendium of Hearing Protection* (DHHS (NIOSH) Publication No. 95-105 or online at <http://www.cdc.gov/niosh/topics/noise/hpcomp.html>. These methods require additional monitoring and are more complex, but provide a more thorough evaluation of protec-

tion. This may be useful in cases where communication is critical or for evaluating hearing protection for employees with hearing impairment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63215, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63220 Make sure exposed employees receive training about noise and hearing protection.**

**You must:**

- Train all employees whose noise exposure equals or exceeds 85 dBA TWA<sub>8</sub>

- Provide training when an employee is first assigned to a position involving noise exposure that equals or exceeds 85 dBA TWA<sub>8</sub> and at least annually after that

- Update information provided in the training program to be consistent with changes in controls, hearing protectors and work processes

- Make sure your noise and hearing protection training includes:

- The effects of noise on hearing (including both occupational and nonoccupational exposures)

- Noise controls used in your workplace

- The purpose of hearing protectors: The advantages, disadvantages, and attenuation of various types

- Instructions about selecting, fitting, using, and caring for hearing protection

- The purpose and procedures for program evaluation including audiometric testing and hearing protection auditing when you choose to rely upon auditing (see WAC 296-307-638)

- The employees' right to access records kept by the employer.

- Maintain a written program describing initial and refresher training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63220, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63225 Make sure warning signs are posted for areas where noise levels equal or exceed 115 dBA.**

**You must:**

- Make sure warning signs are posted at the entrances or boundaries of all well-defined work areas where employees may be exposed to noise that equals or exceeds 115 dBA (measured using a sound level meter with slow response).

- Warning signs must clearly indicate that the area is a high noise area and that hearing protectors are required.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63225, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63230 Arrange for oversight of audiometric testing.**

**You must:**

- Make sure audiometric testing as described by WAC 296-307-636 is supervised and reviewed by one of the following licensed or certified individuals:

- An audiologist
  - An otolaryngologist
  - Another qualified physician.

- Make sure audiograms are conducted by one of the above individuals or by a technician certified by the Council

of Accreditation in Occupational Hearing Conservation (CAOHC) and responsible to a qualified reviewer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63230, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63235 Identify and correct deficiencies in your hearing loss prevention program.**

**You must:**

- Use audiometric testing to identify hearing loss, which may indicate program deficiencies
- Take appropriate actions when deficiencies are found with your program.

– A deficiency may be indicated when:

■ Any employee experiences measurable hearing loss indicated by a standard threshold shift

**OR**

■ Any employee isn't wearing appropriate hearing protection during an audit when auditing is used in place of baseline audiograms for short term employees (see WAC 296-307-638, Option to audiometric testing).

**Note:** A standard threshold shift or audit deficiency does not necessarily indicate that a significant hearing loss has occurred. These criteria are intended to help identify where there may be flaws in your hearing loss prevention program that can be fixed before permanent hearing loss occurs. There are additional statistical tools and tests that may be used to improve the effectiveness of your program. Staff conducting audiometric testing and auditing may be able to suggest additional ways to improve your hearing loss prevention program and tailor it to your worksite.

**You must:**

- Evaluate the following, at a minimum, when responding to a standard threshold shift:
  - Employee noise exposure measurements
  - Noise controls in the work area
  - The selection of hearing protection available and refit employees as necessary
  - Employee training on noise and the use of hearing protection and conduct additional training as necessary.

**Reference:** You may use the option of auditing hearing protection (see WAC 296-307-638) for employees hired or transferred to jobs with noise exposure for less than one year. You may also use audiograms provided by a third-party hearing loss prevention program in some circumstances. Details of these program options are found in WAC 296-307-638, Options to audiometric testing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63235, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63240 Document your hearing loss prevention activities.**

**You must:**

- Create and retain records documenting noise exposures. Include, at a minimum:
  - Exposure measurements required by this part for at least two years and for as long as you rely upon them to determine employee exposure
  - Audiometric test records for the duration of employment for the affected employees
  - Hearing protection audits, if you choose to rely upon them, for the duration of employment of the affected employees.

**Note:** • You need to keep as complete a record as possible. Records developed under previous rules or in other jurisdictions need to be kept, even when they do not fulfill the full

requirements of this part. Similarly, records found to have errors in collection or processing need to be kept if they provide an indication of employee exposure or medical condition not found in other records

• You may want to consider your other business needs, such as worker's compensation claims management, before discarding these records.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63240, filed 12/21/04, effective 4/2/05.]

**Noise Measurement and Computation**

**WAC 296-307-634 Summary.**

**Your responsibility:**

Conduct noise monitoring or measurement to evaluate employee exposures in your workplace.

**You must:**

Make sure that noise-measuring equipment meets recognized standards

WAC 296-307-63405

Measure employee noise exposure

WAC 296-307-63410

Use these equations when estimating full-day noise exposure from sound level measurements

WAC 296-307-63415.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-634, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63405 Make sure that noise-measuring equipment meets recognized standards.**

**You must:**

• Make sure that noise dosimetry equipment meets these specifications:

– Dosimeters must be equipment class 2AS-90/80-5 of the American National Rule Specification for Personal Noise Dosimeters, ANSI S1.25-1991, such dosimeters are normally marked "Type 2."

**Note:** Make sure any dosimeter you use is Type 2 equipment that:

- Uses slow integration and A-weighting of sound levels.
- Has the **criterion level** set to 90 dB, so the dosimeter will report a constant 8-hour exposure at 90 dBA as a 100% dose.
- Has the **threshold level** set at 80 dB, so the dosimeter will register all noise above 80 dB.
- Uses a 5 dB **exchange rate** for averaging of noise levels over the sample period.

**You must:**

• Make sure that sound level meters meet these specifications:

– American National Standard Specification for Sound Level Meters, S1.4-1984, Type 2 requirements for sound level meters, such sound level meters are normally marked "Type 2."

■ For continuous noise measurements, the meter must be capable of measuring A-weighted sound levels with slow response

■ For impulse or impact noise measurements, the meter must be capable of indicating maximum C-weighted sound level measurements with fast response.

• Calibrate dosimeters and sound level meters used to monitor employee noise exposure:

– Before and after each day's use

**AND**

– Following the instrument manufacturer's calibration instructions.

- Note:**
- You may conduct dosimetry using an exchange rate less than 5 dB and compare the results directly to the noise evaluation criteria in Table I
  - For measuring impulse and impact noise you may also use a sound level meter set to measure maximum impulse C-weighted sound levels or peak C-weighted sound levels.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63405, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63410 Measure employee noise exposure.**

**IMPORTANT:**

A noise dosimeter is the basis for determining total daily noise exposure for employees. However, where you have constant noise levels, you may estimate employee noise exposure using measurements from a sound level meter. Calculation of the employee noise exposure must be consistent with WAC 296-307-63415.

**You must:**

- Include all:
  - Workplace noise from equipment and machinery in use
  - Other noise from sources necessary to perform the work
  - Noise outside the control of the exposed employees.
- Use a noise dosimeter when necessary to measure employee noise dose
- Use a sound level meter to evaluate continuous and impulse noise levels
- Identify all employees whose exposures equal or exceed the Noise Evaluation Criteria as follows:

**Noise Evaluation Criteria**

Criteria	Description	Requirements
85 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	<ul style="list-style-type: none"> <li>– Hearing protection</li> <li>– Training</li> <li>– Audiometric testing</li> </ul>
90 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	Noise controls (in addition to the requirements for 85 dBA TWA <sub>8</sub> )
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	<ul style="list-style-type: none"> <li>– Hearing protection</li> <li>– Signs posted in work areas warning of exposure</li> </ul>
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63410, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63415 Use these equations when estimating full-day noise exposure from sound level measurements.**

**You must:**

- Compute employee's full-day noise exposure by using the appropriate equations from Table 3 "Noise Dose Computation" when using a sound level meter to estimate noise dose.

**Table 3  
Noise Dose Computation**

Description	Equation
Compute the noise dose based on several time periods of constant noise during the shift	The total noise dose over the work day, as a percentage, is given by the following equation where C <sub>n</sub> indicates the total time of exposure at a specific noise level, and T <sub>n</sub> indicates the reference duration for that level. $D = 100 * ((C_1/T_1) + (C_2/T_2) + (C_3/T_3) + \dots + (C_n/T_n))$
The reference duration is equal to the time of exposure to continuous noise at a specific sound level that will result in a one hundred percent dose	The reference duration, T, for sound level, L, is given in hours by the equation: $T = 8 / (2^{((L - 90)/5)})$
Given a noise dose as a percentage, compute the equivalent eight-hour time weighted average noise level	The equivalent eight-hour time weighted average, TWA <sub>8</sub> , is computed from the dose, D, by the equation: $TWA_8 = 16.61 * \text{Log}_{10}(D/100) + 90$

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63415, filed 12/21/04, effective 4/2/05.]

**Audiometric Testing**

**WAC 296-307-636 Summary.**

**Your responsibility:**

To conduct audiometric testing of employees exposed to noise to make sure that their hearing protection is effective.

**You must:**

- Provide audiometric testing at no cost to employees  
WAC 296-307-63605
- Establish a baseline audiogram for each exposed employee  
WAC 296-307-63610
- Conduct annual audiograms  
WAC 296-307-63615
- Review audiograms that indicate a standard threshold shift  
WAC 296-307-63620
- Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing  
WAC 296-307-63625

[Title 296 WAC—p. 2629]

Make sure a record is kept of audiometric tests

WAC 296-307-63630

Make sure audiometric testing equipment meets these requirements

WAC 296-307-63635.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-636, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63605 Provide audiometric testing at no cost to employees.**

**You must:**

- Provide audiograms, including any required travel or necessary additional examinations or testing, at no cost to exposed employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63605, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63610 Establish a baseline audiogram for each exposed employee.**

**You must:**

- Conduct a baseline audiogram when an employee is first assigned to work involving noise exposures that equal or exceed 85 dBA TWA<sub>8</sub>.

- Make sure this audiogram is completed no more than one hundred eighty days after the employee is first assigned

**OR**

- Make sure employee is covered by a hearing protection audit program (as described by WAC 296-307-638 and available as an alternative only for employees hired for less than one year).

**Note:** Employers who utilize mobile test units are allowed up to one year to obtain a valid baseline audiogram for each exposed employee. The employees must still be given training and hearing protection as required by this part.

**You must:**

- Make sure employees are not exposed to workplace noise at least fourteen hours before testing to establish a baseline audiogram.

- Hearing protectors may be used to accomplish this.

- Notify employees of the need to avoid high levels of nonoccupational noise exposure (such as loud music, headphones, guns, power tools, motorcycles, etc.) during the fourteen-hour period immediately preceding the baseline audiometric examination.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63610, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63615 Conduct annual audiograms.**

**You must:**

- Conduct annual audiograms for employees as long as they continue to be exposed to noise that equals or exceeds 85 dBA TWA<sub>8</sub>.

**Note:** Annual audiometric testing may be conducted at any time during the work shift. By conducting the annual audiogram during the work shift with the employee exposed to typical noise for their job, the test may record a temporary threshold shift. This makes the test more sensitive to potential hearing loss and may help you improve employee protection before a permanent threshold shift occurs. A suspected temporary shift is one reason an employer may choose to retest employee hearing.

**You must:**

- Make sure each employee is informed of the results of his or her audiometric test.

- Include whether or not there has been a hearing level decrease or improvement since their previous test.

- Make sure each employee's annual audiogram is compared to his or her baseline audiogram by an audiologist, otolaryngologist, another qualified physician, or the technician conducting the test to determine if a standard threshold shift has occurred.

- If the annual audiogram indicates that an employee has suffered a standard threshold shift, you may obtain a retest within thirty days and consider the results of the retest as the annual audiogram.

- Make sure that an audiologist, otolaryngologist, or other qualified physician sees any annual audiogram that indicates a standard threshold shift.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63615, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63620 Review audiograms that indicate a standard threshold shift.**

**You must:**

- Make sure the healthcare professional supervising audiograms has:

- A copy of this part

- The baseline audiogram and most recent audiogram of the employee to be evaluated

- Background noise level records for the testing room

- Calibration records for the audiometer.

- Obtain an opinion from the healthcare professional supervising audiograms as to whether the audiograms indicate possible occupational hearing loss and any recommendations for changes in hearing protection.

- Pay for any clinical audiological evaluation or otological examination required by the reviewer, if:

- Additional review is necessary to evaluate the cause of hearing loss

**OR**

- If there is indication of a medical condition of the ear caused or aggravated by the wearing of hearing protectors.

- Inform the employee in writing of the existence of a standard threshold shift within twenty-one calendar days of the determination.

- Make arrangements for the reviewer to communicate to the employee any suspected medical conditions that are found unrelated to your workplace. This information is confidential and must be handled appropriately.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63620, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63625 Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.**

**You must:**

- Keep the baseline audiogram without revision, unless a qualified reviewer determines:

- The standard threshold shift revealed by the audiogram is persistent

**OR**

– The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63625, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63630 Make sure a record is kept of audiometric tests.**

**You must:**

- Retain a legible copy of all employee audiograms conducted under this part.
  - Make sure the record includes:
    - Name and job classification of the employee
    - Date of the audiogram
    - The examiner's name
    - Date of the last acoustic or exhaustive calibration of the audiometer
    - Employee's most recent noise exposure assessment
    - The background sound pressure levels in audiometric test rooms.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63630, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-63635 Make sure audiometric testing equipment meets these requirements.**

**You must:**

- Use pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz
  - Tests at each frequency must be taken separately for each ear
  - Supra-aural headphones must be used.
- Conduct audiometric tests with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used according to, American National Standard Specification for Audiometers, S3.6-1996
  - Check the functional operation of the audiometer each day before use by doing all of the following:
    - Make sure the audiometer's output is free from distorted or unwanted sound
    - Test either a person with known, stable hearing thresholds or a bio-acoustic simulator
    - Perform acoustic calibration for deviations of 10 dB or greater.
  - Audiometer calibration must be checked acoustically at least annually to verify continued conformance with ANSI S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check
  - An exhaustive calibration must be performed at least every two years according to the American National Standard Specification for Audiometers, S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from the calibration
  - Provide audiometric test rooms that meet the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms using the following table of Maximum Ambient Sound Pressure Levels:

(2007 Ed.)

**Table 4  
Maximum Ambient Sound Pressure Levels**

Frequency (Hz)	500	1000	2000	4000	8000
Sound Pressure Level (dB)	40	40	47	57	62

**Note:** The American Industrial Hygiene Association and National Hearing Conservation Association recommend conducting audiograms using the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms with adjustments at only 500 Hz and below.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63635, filed 12/21/04, effective 4/2/05.]

**Options to Audiometric Testing**

**WAC 296-307-638 Summary.**

**Your responsibility:**

This section provides options to baseline audiometric testing for employees assigned to duties with noise exposures for **less than one year**. These program options may also be used to provide added assessment of longer-term employees in addition to audiometric testing.

The requirements of this section apply only if you decide to use auditing or a third-party hearing loss prevention program and do not conduct baseline audiometric testing for those employees.

**Hearing Protection Audits**

**You must:**

- Conduct hearing protection audits at least quarterly  
WAC 296-307-63805
- Make sure staff conducting audits are properly trained  
WAC 296-307-63810
- Assess the hearing protection used by each employee during audits  
WAC 296-307-63815
- Document your hearing protection audits  
WAC 296-307-63820

**Third-Party Audiometric Testing**

**You must:**

Make sure third-party hearing loss prevention programs meet the following requirements  
WAC 296-307-63825

**IMPORTANT:**

**Hearing protection audits** are a tool for use in evaluating your hearing loss prevention program in cases where audiometric testing does not provide a useful measure. For example, if most of your employees are hired on a temporary basis for a few months at a time, audiometric testing may not identify the small changes in hearing acuity that could occur. Auditing provides an alternative to audiometric testing in these cases.

Auditing is not required unless you use it in place of baseline audiometric testing for employees hired for a period of **less than one year** and is permitted as a substitute for audiometric testing only for these employees.

**Third-party hearing loss prevention programs** are full hearing loss prevention programs and are distinct from audiometric testing provided by third parties as part of your own hearing loss prevention program. These programs may

be organized by labor groups, trade associations, labor-management cooperatives, or other organizations to:

- Cover a specific group of employees

**OR**

- Combine efforts for several employers with common employees.

Although you remain responsible for the program, third-party programs can have at least two benefits over running your own program:

- The audiometric testing is portable between the participating employers so new testing will not be needed when an employee changes employers

- Employees who only work for short periods for any one employer can be monitored under the group program over a longer period of time increasing the effectiveness of the audiometric testing in preventing hearing loss for these employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-638, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-63805 Conduct hearing protection audits at least quarterly.**

**You must:**

- Conduct audits at least quarterly to provide a representative assessment of your workplace

- The assessment is representative if it:

- Covers all processes and work activities in your business at full production levels

**AND**

- Covers all employees present on the audit day.

- If your business is mobile or involves variable processes, auditing may need to be repeated more often than quarterly

- Auditing does not need to be repeated more than monthly as long as a reasonable effort is made to cover:

- The activities with greatest exposure

**AND**

- As many employees as possible.

- Assess exposures and hearing protection for the full shift for each employee covered at the time of the audit.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63805, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-63810 Make sure staff conducting audits are properly trained.**

**You must:**

- Make sure staff conducting hearing protection audits:

- Can demonstrate competence in:

- Evaluating hearing protection attenuation

- Evaluating hearing protector choices

- Assessing the correct use of hearing protectors.

- Are certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) or have training in the following areas:

- Noise and hearing loss prevention

- Washington state noise regulations

- Hearing protectors

- Fitting of hearing protectors

- Basic noise measurement

- Hearing loss prevention recordkeeping.

[Title 296 WAC—p. 2632]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63810, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-63815 Assess the hearing protection used by each employee during audits.**

**You must:**

- Confirm that:

- Current site conditions during audits are consistent with conditions existing during noise monitoring

- The hearing protection used by the employee is sufficient and appropriate for the conditions

- The hearing protection is worn properly

- The employees are satisfied with the performance and comfort of the hearing protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63815, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-63820 Document your hearing protection audits.**

**You must:**

- Keep a record of audit results for each employee assessed for the length of their employment and for the length of time you will rely upon the audit results

- Include the following information in the record:

- The make and model of the hearing protectors

- The size of the protectors

- Average noise exposure of the employee

- Any problems found with use of the hearing protection

- Any comments or complaints from the employee regarding the hearing protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63820, filed 12/21/04, effective 4/2/05.]

### **Third-party Audiometric Tests**

#### **WAC 296-307-63825 Make sure third-party hearing loss prevention programs meet the following requirements.**

**IMPORTANT:**

Third-party hearing loss prevention programs are intended:

- For short-term employees hired or assigned to duties having noise exposures **for less than one year**

**AND**

- For seasonal employees.

However, other employees may be included as long as you meet all requirements for hearing loss follow-ups and recordkeeping.

**You must:**

- Make sure that the third-party program is:

- Equivalent to an employer program as required by this part

**AND**

- Uses audiometric testing to evaluate hearing loss.

- Make sure a licensed or certified audiologist, otolaryngologist, or other qualified physician administers the third-party program

- Make sure the third-party program has written procedures for:

- Communicating with participating employers of program requirements

(2007 Ed.)

- Follow-up procedures for detected hearing loss
- Annual review of participating employer programs.
- Make sure the following program elements are corrected by you or the third-party program when deficiencies are found:
  - Noise exposures
  - Hearing protection
  - Employee training
  - Noise controls.
- Obtain a review of your hearing loss prevention program at least once per year, conducted by the third-party program administrator or their representative, in order to:
  - Identify any tasks needing a revised selection of hearing protection

**AND**

- Provide an overall assessment of the employers' hearing loss prevention activities.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-63825, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-640 Noise definitions.**

**A-weighted** - An adjustment to sound level measurements that reflects the sensitivity of the human ear. Used for evaluating continuous or average noise levels.

**Audiogram** - A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**Audiologist** - A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing, and Language Association, or the American Academy of Audiology, and is licensed by the state board of examiners.

**Baseline audiogram** - The audiogram against which future audiograms are compared. The baseline audiogram is collected when an employee is first assigned to work with noise exposure. The baseline audiogram may be revised if persistent standard threshold shift (STS) of improvement is found.

**Continuous noise** - Noise with peaks spaced no more than one second apart. Continuous noise is measured using sound level meters and noise dosimeters with the slow response setting.

**Criterion sound level** - A sound level of ninety decibels. An eight-hour exposure to constant 90 dBA noise is a one hundred percent noise dose exposure.

**C-weighted** - An adjustment to sound level measurements that evenly represents frequencies within the range of human hearing. Used for evaluating impact or impulse noise.

**Decibel (dB)** - Unit of measurement of sound level. A-weighting, adjusting for the sensitivity of the human ear, is indicated as "dBA." C-weighting, an even reading across the frequencies of human hearing, is indicated as "dBC."

**Fast response** - A setting for a sound level meter that will allow the meter to respond to noise events of less than one second. Used for evaluating impulse and impact noise levels.

**Hertz (Hz)** - Unit of measurement of frequency, numerically equal to cycles per second.

**Impulsive or impact noise** - Noise levels which involve maxima at intervals greater than one second. Impulse and

impact noise are measured using the fast response setting on a sound level meter.

**Noise dose** - The total noise exposure received by an employee during their shift. It can be expressed as a percentage indicating the ratio of exposure received to the noise exposure received in an eight-hour exposure to constant noise at 90 dBA. It may also be expressed as the sound level that would produce the equivalent exposure during an eight-hour period ( $TWA_8$ ).

**Noise dosimeter** - An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

**Occupational hearing loss** - A reduction in the ability of an individual to hear either caused or contributed to by exposure in the work environment.

**Otolaryngologist** - A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

**Permanent threshold shift** - A hearing level change that has become persistent and is not expected to improve.

**Qualified reviewer** - An audiologist, otolaryngologist, or other qualified physician who has experience and training in evaluating occupational audiograms.

**Slow response** - A setting for sound level meters and dosimeters in which the meter does not register events of less than about one second. Used for evaluating continuous and average noise levels.

**Sound level** - The intensity of noise as indicated by a sound level meter.

**Sound level meter** - An instrument that measures sound levels.

**Standard threshold shift (STS)** - A hearing level change, relative to the baseline audiogram, of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

**Temporary threshold shift** - A hearing level change that improves. A temporary threshold shift may occur with exposure to noise and hearing will return to normal within a few days. Temporary threshold shifts can be indicators of exposures that lead to permanent hearing loss.

**$TWA_8$  - Equivalent eight-hour time-weighted average sound level** - That sound level, which if constant over an eight-hour period, would result in the same noise dose measured in an environment where the noise level varies.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-640, filed 12/21/04, effective 4/2/05.]

## Part Y-8 Confined Spaces

**WAC 296-307-642 Scope.** This part applies to all confined spaces and provides requirements to protect employees from the hazards of entering and working in confined spaces. This part applies in any of the following circumstances:

- You have confined spaces in your workplace.
- Your employees will enter another employer's confined spaces.
- A contractor will enter your confined spaces.
- You provide confined space rescue services.

You can use Table 1 to help you decide which requirements to follow for confined spaces.

**Table 1**  
**Requirements for Confined Spaces**

For confined spaces that are	The requirements in the following sections apply					
	644	646	648	650	652	654
Permit-required confined spaces	X	X	X	X	X	X
Entered by a contractor	X	X	X	X	X	X
Nonpermit confined spaces	X					X
Never entered	X					
<b>If you only:</b>						
Use alternate entry procedures	X	X	X		X	
Have a contractor enter your space	X					
Are a rescue service provider		X	X	X		

**Definition:**

A **confined space** is a space that is ALL of the following:

- Large enough and arranged so an employee could fully enter the space and work.
- Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.
- Not primarily designed for human occupancy.

**Note:**

- Requirements in other chapters may apply to your work. You will find some safety and health requirements are addressed on a broad level in this part, while being addressed for a specific application in another rule. When this happens, both requirements apply and should not conflict. When a conflict does occur, you need to follow the more specific requirement.
- If you are uncertain which requirements to follow, contact your local labor and industries (L&I) office.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-642, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-644 Summary. Identifying and controlling permit-required confined spaces.**

**Your responsibility:**

To identify your permit-required confined spaces and control employee entry.

**You must:**

Identify permit-required confined spaces.

**WAC 296-307-64402**

Inform employees and control entry to permit-required confined spaces.

**WAC 296-307-64404**

Follow these requirements when you contract with another employer to enter your confined space.

**WAC 296-307-64406**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-644, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-64402 Identify permit-required confined spaces.**

**IMPORTANT:**

If your workplace contains only nonpermit confined spaces and your employees do not enter another employer's confined space, you may follow only the requirements in:

- WAC 296-307-644, Identifying and controlling permit-required confined spaces; and
- WAC 296-307-654, Nonpermit confined space requirements.

[Title 296 WAC—p. 2634]

**You must:**

- Identify all permit-required confined spaces in your workplace.
- Assume any confined space is a permit-required confined space, unless you determine the space to be a nonpermit confined space.
  - If you enter the space to determine the hazards, follow the requirements in WAC 296-307-650, Permit entry procedures.
  - If you evaluate the confined space and there are no potential or actual hazards, you can consider it to be a nonpermit confined space.
- Document your determination that the space is nonpermit, as required by WAC 296-307-654.

**Definitions:**

A **permit-required confined space or permit space** is a confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material with the potential for engulfing someone who enters the space.
- Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross-section.
- Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.
- Contains any other recognized safety or health hazard that could either:

- Impair the ability to self rescue;

**OR**

- Result in a situation that presents an immediate danger to life or health.

A **nonpermit confined space** is a confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-64402, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-64404 Inform employees and control entry to permit-required confined spaces.**

**You must:**

- (1) Provide information about confined spaces as follows:

- Make available to affected employees and their authorized representatives all information and documents required by this part.

- Inform affected employees about the existence, location, and danger of any permit-required confined spaces in your workplace by:

- Posting danger signs; or
- Using any other equally effective means to inform employees.

**Note:** A sign reading "Danger-Permit Required Confined Space, DO NOT ENTER" or using pictures or other similar wording employees can understand would satisfy the requirement for a sign.

**You must:**

(2) Take effective measures to prevent unauthorized employees from entering permit-required confined spaces.

**Note:** Examples of measures to prevent employee entry include padlocks, bolted covers, special tools to remove covers, and providing employee training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-64404, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-64406 Follow these requirements when you contract with another employer to enter your confined space.**

**IMPORTANT:**

The contractor is responsible for following all confined space requirements in this part and in other rules that apply.

**You must:**

- Do **all** of the following if you arrange to have another employer (contractor) perform work that involves entry into your permit-required confined space:

- Inform the contractor:

- That the workplace contains permit-required confined spaces and entry is allowed only if the applicable requirements of this part are met.

- Of the identified hazards and your experience with each permit-required confined space.

- Of any precautions or procedures you require for the protection of employees in or near spaces where the contractor will be working.

- Coordinate entry operations with the contractor, when either employees or employers from the different companies will be working in or near permit-required confined spaces.

- Discuss entry operations with the contractor when they are complete. Include the following in your discussion:

- The program followed during confined space entry; and

- Any hazards confronted or created.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-64406, filed 12/21/04, effective 4/2/05.]

**Permit-required Confined Space Program**

**WAC 296-307-646 Summary.**

**Your responsibility:**

**To develop your permit-required confined space program and practices.**

**IMPORTANT:**

This section applies if employees will enter a permit-required confined space.

- Inform the host employer, either through a debriefing

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**You must:**

Develop a written permit-required confined space program.

**WAC 296-307-64602**

Meet these additional requirements if your employees enter another employer's confined space.

**WAC 296-307-64604**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-646, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-64602 Develop a written permit-required confined space program.**

**IMPORTANT:**

- Identify and evaluate the hazards of permit-required confined spaces and the work performed, to assist you in developing your entry program.

**You must:**

- Develop a written program, before employees enter, that describes the means, procedures, and practices you use for the safe entry of permit-required confined spaces as required by this part. Include the following when applicable to your confined space entry program:

- Documentation of permit entry procedures.

- Documentation used for alternate entry procedures.

- How to reclassify permit-required confined spaces to nonpermit spaces.

- Designation of employee roles, such as entrants, attendants, entry supervisors, rescuers, or those who test or monitor the atmosphere in a permit-required space.

- Identification of designated employee duties.

- Training employees on their designated roles.

- How to identify and evaluate hazards.

- Use and maintenance of equipment.

- How to prevent unauthorized entry.

- How to coordinate entry with another employer.

- How to rescue entrants.

**Note:** For alternate entry, your written program only needs to meet the requirements of WAC 296-307-648, Employee training, and WAC 296-307-652, Alternate entry procedures, of this part.

**You must:**

- Consult with affected employees and their authorized representatives when developing and implementing all aspects of your permit-required confined space program.

- Make the written program available to employees and their authorized representatives.

- Update your written program as necessary.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-64602, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-64604 Meet these additional requirements if your employees enter another employer's confined space.**

**You must:**

- Obtain any available information about permit-required confined space hazards and entry operations from the host employer.

- Coordinate entry operations with any other employers whose employees will be working in or near the permit-required confined space.

or during entry operations, about:

[Title 296 WAC—p. 2635]

- The entry program you will follow; and
- Any hazards you confronted or created in the space during entry operations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-64604, filed 12/21/04, effective 4/2/05.]

### Employee Training

#### WAC 296-307-648 Summary.

##### Your responsibility:

**To make sure employees are trained to perform their designated roles safely.**

##### You must:

Provide employee training.

#### WAC 296-307-64802

Certify employee proficiency.

#### WAC 296-307-64804

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-648, filed 12/21/04, effective 4/2/05.]

#### WAC 296-307-64802 Provide employee training.

##### You must:

- Provide training to each employee involved in permit-required confined space activities, so they acquire the understanding, knowledge and skills necessary to safely perform assigned duties.

- Establish employee proficiency in their confined space duties.

- Introduce new or revised procedures as necessary.

##### Note:

- Employers can determine employee proficiency by:
  - Observing employee performance during training exercises that simulate actual confined space conditions.
  - A comprehensive written examination; or
  - Any other method that is effective for the employer.

##### You must:

- Provide training at the following times:
  - Before an employee is first assigned to duties covered by this part.
  - Before there is a change in an employee's assigned duties.

- When there is a permit-required confined space hazard for which the employee has not already been trained.

- If you have reason to believe that there are either:

- Deviations from your procedures for permit-required confined space entry; or

- Employee knowledge or use of your procedures is inadequate.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-64802, filed 12/21/04, effective 4/2/05.]

#### WAC 296-307-64804 Certify employee proficiency.

##### You must:

- Certify employee proficiency in their assigned duties.

- Make sure the certification:

- Contains each employee's name, the trainer's written or electronic signature or initials, and the dates of training.

- Is available for inspection by employees and their authorized representatives.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-64804, filed 12/21/04, effective 4/2/05.]

[Title 296 WAC—p. 2636]

### Permit Entry Procedures

#### WAC 296-307-650 Summary.

##### Your responsibility:

To establish procedures for the safe permit-required entry of confined spaces.

Implement procedures for entry permits.

#### WAC 296-307-65002

Use an entry permit that contains all required information.

#### WAC 296-307-65004

Keep and review your entry permits.

#### WAC 296-307-65006

Prevent unauthorized entry.

#### WAC 296-307-65008

Provide, maintain, and use proper equipment.

#### WAC 296-307-65010

Evaluate and control hazards for safe entry.

#### WAC 296-307-65012

Make sure you have adequate rescue and emergency services available.

#### WAC 296-307-65014

Use nonentry rescue systems or methods whenever possible.

#### WAC 296-307-65016

Make sure entry supervisors perform their responsibilities and duties.

#### WAC 296-307-65018

Provide an attendant outside the permit-required confined space.

#### WAC 296-307-65020

Make sure entrants know the hazardous conditions and their duties.

#### WAC 296-307-65022

Implement procedures for ending entry.

#### WAC 296-307-65024

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-650, filed 12/21/04, effective 4/2/05.]

#### WAC 296-307-65002 Implement procedures for entry permits.

##### You must:

- Identify and evaluate, before employees enter, potential hazards from:

- The permit-required confined space; and

- The work to be performed.

- Complete an entry permit before entry is authorized, documenting that you have completed the means, procedures and practices necessary for safe entry and work.

- Make sure that entrants or their representatives have an opportunity to observe any monitoring or testing, or any actions to eliminate or control hazards, performed to complete the permit.

- Identify the entry supervisor.

- Make sure the entry supervisor signs the entry permit, authorizing entry, before the space is entered.

- Make the completed permit available to entrants or their authorized representatives at the time of entry.

- Do this by either posting the completed permit at the entry location, or by any other equally effective means.

- Make sure the duration of the permit does not exceed the time required to complete the assigned task or job identified on the permit.

- Note any problems encountered during an entry operation on the permit. Use the information to make appropriate revisions to your program, entry operations, means, systems, procedures and practices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65002, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65004 Use an entry permit that contains all required information.**

**You must:**

- Make sure your entry permit identifies all of the following that apply to your entry operation:

- The space to be entered.
- Purpose of the entry.
- Date and the authorized duration of the entry permit.
- Hazards of the space to be entered.
- Acceptable entry conditions.
- Results of initial and periodic tests performed to evaluate and identify the hazards and conditions of the space, accompanied by the names or initials of the testers and by an indication of when the tests were performed.

- Appropriate measures used before entry to isolate the space, and eliminate or control hazards.

- Examples of appropriate measures include the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit-required confined spaces.

- Names of entrants and current attendants.

- Other means include the use of rosters or tracking systems as long as the attendant can determine quickly and accurately, for the duration of the permit, which entrants are inside the space.

- The current entry supervisor.
- A space for the signature or initials of the original supervisor authorizing entry.

- Communication procedures for entrants and attendants to maintain contact during the entry.

- Equipment provided for safe entry, such as:

- Personal protective equipment (PPE).
- Testing equipment.
- Communications equipment.
- Alarm systems.
- Rescue equipment.

- Rescue and emergency services available, and how to contact them. Include equipment to use, and names and contact information.

- Other information needed for safety in the particular confined space.

- Additional permits issued for work in the space, such as for hot work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65004, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65006 Keep and review your entry permits.**

**You must:**

- Keep entry permits for at least one year.

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- Keep entry permits or other atmospheric monitoring records that show the actual atmosphere an employee entered or worked in, as employee exposure records.

- Review your permit-required confined space entry program as follows:

- Conduct a review when you have any reason to believe your entry program may not protect employees, and revise your program before allowing subsequent entries.

**Note:** Examples of circumstances requiring the review of your program include the following:

- There is unauthorized entry of a permit space.
- A permit space hazard not covered by the permit is found.
- A condition prohibited by the permit occurs.
- An injury or near-miss occurs during entry.
- There is a change in the use or configuration of a permit space.
- An employee complains about the effectiveness of the program.

**You must:**

- Review canceled entry permits within one year following each entry to evaluate:

- Your permit-required confined space program.
- The protection provided to employees entering permit-required confined spaces.

- Update your written permit-required confined space entry program as necessary.

**Note:** Employers may perform a single annual review covering all entries performed during a twelve-month period. If no entry is performed during a twelve-month period, no review is necessary.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65006, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65008 Prevent unauthorized entry.**

**You must:**

- Implement measures necessary to prevent unauthorized entry into permit-required confined spaces, when conducting authorized entry.

**Note:**

- When removing entrance covers to open the confined space, protect entrants and those outside the confined space from hazards.
- Examples of measures to prevent unauthorized entry are signs, barricades, warning tape, and an attendant.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65008, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65010 Provide, maintain, and use proper equipment.**

**You must:**

- Provide the equipment in Table 2, when needed and at no cost to employees.

- Make sure that employees use provided equipment properly.

- Maintain the provided equipment.

**Table 2  
Equipment Provided to Employees at No Cost**

Type of equipment	For
Testing and monitoring equipment	Evaluating permit-required confined space conditions
Ventilating equipment	Obtaining and maintaining acceptable entry conditions

[Title 296 WAC—p. 2637]

**Table 2**  
**Equipment Provided to Employees at No Cost**

Type of equipment	For
Communication equipment	Effective communication between the attendant and the entrants and to initiate rescue when required
Personal protective equipment (PPE)	Protecting employees from hazards of the space or the work performed
Lighting equipment	Employees to see well enough to work safely and to exit the space quickly in an emergency
Barriers or shields, such as pedestrian, vehicle or other barriers	Protecting employees from hazards outside of the space
Ladders	Safe entry and exit by entrants
Rescue and emergency equipment, except for equipment provided by the rescue service provider	Safe and effective rescue
Any other equipment	Safe entry into and rescue from permit-required confined spaces

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65010, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65012 Evaluate and control hazards for safe entry.**

- Evaluate and control hazards for safe entry into permit-required confined spaces by doing all the following:
  - Test for atmospheric hazards, in this order:
    - Oxygen.
    - Combustible gases and vapors.
    - Toxic gases and vapors.
  - Provide each entrant or their authorized representative an opportunity to observe any of the following:
    - Preentry testing.
    - Subsequent testing.
    - Monitoring of permit-required spaces.
  - Reevaluate the permit-required space in the presence of any entrant, or their authorized representative, who requests this to be done because they have reason to believe that the evaluation of that space may not have been adequate.
    - Upon request, immediately provide each entrant or their authorized representative, with the results of any testing required by this rule.
    - Continuously monitor conditions in areas where entrants are working, when isolation of the space is not feasible.
      - Examples would be a large space or space that is part of a continuous system, such as a sewer.
      - Evaluate space conditions during entry as follows:

[Title 296 WAC—p. 2638]

**Table 3**  
**Evaluating Space Conditions**

You must:	In order to
Test conditions before entry	Determine that acceptable entry conditions exist before entry is authorized by the entry supervisor
Test or evaluate space conditions during entry	Determine that acceptable entry conditions are being maintained during entry operations
Evaluate entry operations	Make sure entrants of more than one employer working at the same time in or around a permit-required confined space, do not endanger each other

**IMPORTANT:**

This section applies to both:

- Employers whose employees use permit entry procedures; and
- Employers who provide rescue services.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65012, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65014 Make sure you have adequate rescue and emergency services available.**

**You must:**

(1) Make sure you have adequate rescue and emergency services available during your permit-required confined space entry operations.

- Evaluate and select rescue teams or services who can:
  - Respond to a rescue call in a timely manner. Timeliness is based on the identified hazards. Rescuers must have the capability to reach potential victims within an appropriate time frame based on the identified permit space hazards.
  - Proficiently rescue employees from a permit-required confined space in your workplace. Rescuers must have the appropriate equipment for the type of rescue.
    - Make sure that at least one member of the rescue team or service holds a current certification in first aid and cardiopulmonary resuscitation (CPR).
    - Inform each rescue team or service about the hazards they may confront when called to perform rescue.
    - Provide the rescue team or service with access to all permit spaces from which rescue may be necessary.
      - This will allow them to develop appropriate rescue plans and to practice rescue operations.

**Note:** What will be considered timely will vary according to the specific hazards involved in each entry. For example, WAC 296-307-594, Respirators, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) for work areas considered to contain an IDLH atmosphere.

**You must:**

(2) Provide employees, assigned to provide permit-required confined space rescue and emergency services, with:

- Personal protective equipment (PPE) needed for safe entry.
- Other equipment required to conduct rescues safely.
- Training so they are:
  - Proficient in the use of the PPE and other equipment.

(2007 Ed.)

- Proficient as an entrant of permit-required confined spaces.
- Able to safely perform assigned rescue and emergency duties.
- Knowledgeable in basic first aid and cardiopulmonary resuscitation (CPR).
  - Practice sessions for permit-required confined space rescues **at least** once every twelve months where dummies, manikins, or actual persons are removed from either:
    - The actual permit spaces; or
    - Representative permit spaces that simulate the opening size, configuration, and accessibility, of permit spaces where rescue will be performed.
- (3) Establish procedures for:
  - Contacting rescue and emergency services.
  - Rescuing entrants from permit-required confined spaces.
  - Providing necessary emergency services to rescued entrants.
  - Preventing unauthorized persons from attempting a rescue.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65014, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65016 Use nonentry rescue systems or methods whenever possible.**

**You must:**

- Use nonentry retrieval systems or methods to rescue entrants in a permit-required confined space unless this:
  - Would increase the overall risk of injury to entrants; or
  - Would not contribute to the rescue of the entrant.
- Make sure each entrant uses a chest or full-body harness, with a retrieval line attached to the harness at one of the following locations:
  - At the center of the employee's back, near shoulder level.
  - Above the employee's head.
  - At another point which presents a profile small enough for the successful removal of the employee.
- Attach the retrieval line to a mechanical device or fixed point outside the space, so rescue can begin as soon as necessary.
- Make sure a mechanical device is available to retrieve entrants from vertical spaces more than five feet (1.52 m) deep.

**Note:** When you can demonstrate that the use of a chest or full-body harness is not feasible or creates a greater hazard, then you may use wristlets or another method shown to be the safest and most effective alternative.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65016, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65018 Make sure entry supervisors perform their responsibilities and duties.**

**You must:**

- Make sure that an entry supervisor:
  - Authorizes the entry into a permit-required confined space by signing the entry permit.
  - Oversees entry operations.

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- Knows about the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.
  - Verifies and checks **all** of the following:
    - The appropriate entries have been made on the permit.
    - All tests specified by the permit have been conducted.
    - All procedures and equipment specified by the permit are in place before approving the permit and allowing entry to the space.
      - Terminates the entry and cancels the permit when:
        - The assigned task or job has been completed.
        - A condition in the space that is not covered by the entry permit is discovered.
  - Verifies that rescue services are available and that there is a way to contact them.
  - Removes unauthorized individuals who enter or attempt to enter the permit-required confined space during entry operations.
  - Determines that entry operations remain consistent with the terms of the entry permit and acceptable entry conditions are maintained:
    - Whenever responsibility for a permit-required space entry operation is transferred; and
    - At regular intervals dictated by the hazards and operations performed within the space.

**Note:**

- Make sure entry supervisors have the required knowledge and proficiency to perform the job duties and responsibilities required by this part.
- The entry supervisor may also perform other duties under this part, such as attendant or entrant, if they are trained and proficient in those duties.
- The responsibility of the entry supervisor may be passed from one supervisor to another during an entry operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65018, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65020 Provide an attendant outside the permit-required confined space.**

**IMPORTANT:**

- The number of attendants assigned should be tailored to the requirements of the space and the work performed.
- You need to assess if it is appropriate or possible to have multiple permit spaces monitored by a single attendant, or have an attendant stationed at a location outside each space. Video cameras and radios are examples of tools that may assist an attendant monitoring more than one space.
- Attendants may be stationed at any location outside the permit-required confined space if the duties described in this section can be effectively performed for each space that is monitored.

**You must:**

- Provide at least one attendant outside the permit-required confined space during entry operations.
- Make sure each permit-required confined space attendant:
  - Understands the hazards that may be faced during entry, including the mode, signs or symptoms, and results of exposure to the hazards.
  - Is aware of the behavioral effects of exposure to the hazard.
  - Continuously maintains an accurate count of entrants in the space.

[Title 296 WAC—p. 2639]

- Maintains an accurate record of who is in the permit-required confined space.
- Communicates with entrants as necessary to monitor their status or alert them of the need to evacuate the space.
- Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space.
- Orders entrants to evacuate the space immediately if any of the following conditions occur:
  - A prohibited condition.
  - The behavioral effects of hazardous exposure on an entrant.
  - A situation outside the space that could endanger entrants.
  - The attendant cannot effectively and safely perform all the duties required in this part.
    - Takes the following actions when unauthorized persons approach or enter a space:
      - Warns unauthorized persons to stay away from the space.
      - Tells the unauthorized persons to exit immediately if they have entered the space.
      - Informs entrants and the entry supervisor if unauthorized persons have entered the space.
        - Performs nonentry rescues as specified by your rescue procedure.
        - Has the means to respond to an emergency affecting one or more of the permit spaces being monitored without preventing performance of the attendant's duties to the other spaces being monitored.
        - Carries out no duties that might interfere with their primary duty to monitor and protect the entrants.
        - Calls for rescue and other emergency services as soon as entrants may need assistance to escape from the space.
        - Monitors entry operations until relieved by another attendant or all entrants are out of the space.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65020, filed 12/21/04, effective 4/2/05.]

#### **WAC 296-307-65022 Make sure entrants know the hazardous conditions and their duties.**

##### **You must:**

- Make sure that all entrants:
  - Know the hazards they may face during entry, including the mode, signs or symptoms, and results of exposure to the hazards.
    - Use equipment properly.
    - Communicate with the attendant as necessary so the attendant can:
      - Monitor entrant status.
      - Alert entrants of the need to evacuate.
    - Alert the attendant whenever either of these situations exist:
      - A warning sign or symptom of exposure to a dangerous situation such as, behavioral changes, euphoria, giddiness potentially from lack of oxygen or exposure to solvents.
      - A prohibited condition.
        - Exit from the permit-required confined space as quickly as possible when one of the following occurs:
          - The attendant or entry supervisor gives an order to evacuate.

[Title 296 WAC—p. 2640]

- The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
- The entrant detects a prohibited condition.
- An evacuation alarm is activated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65022, filed 12/21/04, effective 4/2/05.]

#### **WAC 296-307-65024 Implement procedures for ending entry.**

##### **You must:**

- Make sure you terminate the entry when entry operations are completed, including securing an entrance cover and canceling the permit.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65024, filed 12/21/04, effective 4/2/05.]

#### **WAC 296-307-652 Alternate entry procedures.**

##### **Summary:**

##### **Your responsibility:**

To choose alternate entry procedures for spaces where the only hazard is a hazardous atmosphere.

##### **IMPORTANT:**

In addition to this section, you also need to meet the requirements in the following sections of this part:

- WAC 296-307-644, Identifying and controlling permit-required confined spaces.
- WAC 296-307-646, Permit-required confined space program.
- WAC 296-307-648, Employee training.

##### **You must:**

Make sure the following conditions are met if using alternate entry procedures.

##### **WAC 296-307-65202**

Follow these alternate entry procedures for permit-required confined spaces.

##### **WAC 296-307-65204**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-652, filed 12/21/04, effective 4/2/05.]

#### **WAC 296-307-65202 Make sure the following conditions are met if using alternate entry procedures.**

##### **You must:**

- Make sure, when using alternate entry procedures, instead of permit entry procedures, that you have monitoring and inspection data that supports the following:
  - That the only hazard of the permit-required confined space is an actual or potentially hazardous atmosphere.
  - That continuous forced air ventilation alone is all that is needed to maintain the permit-required confined space for safe entry.
    - Make sure an entry to obtain monitoring and inspection data or to eliminate hazards is performed according to WAC 296-307-500, Permit entry procedures.
    - Make sure all documentation produced is available to each affected employee and their authorized representative.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65202, filed 12/21/04, effective 4/2/05.]

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**WAC 296-307-65204 Follow these alternate entry procedures for permit-required confined spaces.****You must:**

- Use the following alternate entry procedures:
  - Eliminate any unsafe conditions before removing an entrance cover.
    - When entrance covers are removed, promptly guard the opening with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening and protect entrants from objects falling into the space.
    - Certify that preentry measures have been taken (such as safe removal of the cover and having protection needed to gather preentry data), with the date, location of the space, and signature of the person certifying.
      - Make the preentry certification available before entry to each entrant.
        - Before an employee enters the confined space, test the internal atmosphere with a calibrated, direct-reading instrument for all of the following, in this order:
          - Oxygen content.
          - Flammable gases and vapors.
          - Potential toxic air contaminants.
        - Provide entrants, or their authorized representatives, with an opportunity to observe the preentry and periodic testing.
          - Make sure the atmosphere within the space is not hazardous when entrants are present.
          - Use continuous forced air ventilation, as follows:
            - Wait until the forced air ventilation has removed any hazardous atmosphere before allowing entrants into the space.
            - Direct forced air ventilation toward the immediate areas where employees are, or will be, and continue ventilation until all employees have left the space.
        - Provide the air supply from a clean source and make sure it does not increase hazards in the space.
          - Test the atmosphere within the space as needed to make sure hazards do not accumulate.
          - If a hazardous atmosphere is detected during entry, do all of the following:
            - Evacuate employees from the space immediately.
            - Evaluate the space to determine how the hazardous atmosphere developed.
            - Implement measures to protect employees from the hazardous atmosphere before continuing the entry operation.
            - Verify the space is safe for entry before continuing the entry operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65204, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-654 Nonpermit confined spaces requirements.****Summary:****IMPORTANT:**

A confined space may be classified as a nonpermit confined space for as long as the hazards remain eliminated. Once a hazard is present, you must follow all requirements of this part that apply.

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**Your responsibility:**

To make sure any space you classify as nonpermit does not have the potential to contain serious health or safety hazards.

**You must:**

Follow these requirements when classifying a confined space as a nonpermit confined space.

**WAC 296-307-65402**

Reevaluate nonpermit confined spaces if hazards develop.

**WAC 296-307-65404**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-654, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65402 Follow these requirements when classifying a confined space as a nonpermit confined space.****You must:**

- Make sure the confined space meets these conditions to be classified as nonpermit confined spaces:
  - The confined space does not contain an actual or potential hazardous atmosphere.
  - The confined space does not contain hazards capable of causing death or serious physical harm. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.
    - If you must enter to remove hazards, the space must be treated as a permit-required confined space until hazards have been eliminated.

**Note:**

- Controlling atmospheric hazards through forced air ventilation does not eliminate the hazards.
- You should evaluate the use of lockout-tagout, as covered in WAC 296-307-320, to determine if using it fully eliminates the hazard.
- You are allowed to use alternate entry procedures covered in WAC 296-307-652, if you can demonstrate that forced air ventilation alone will control all hazards in the space.

**You must:**

- Document how you determined the confined space contained no permit-required confined space hazards. Certify this documentation with the following:
  - Date.
  - Location of the space.
  - Signature of the person making the determination.
- Make the certification available to each entrant, or their authorized representative.

**Note:**

This certification must be completed every time a permit-required confined space is reclassified as a nonpermit space.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65402, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-65404 Reevaluate nonpermit confined spaces if hazards develop.****You must:**

- Reclassify a nonpermit confined space to a permit-required confined space, if necessary, when changes in the use or configuration of the space increase the hazards to entrants.
  - Make sure all employees exit the space if hazards develop. You must then reevaluate the space and determine whether it must be reclassified as a permit-required confined space.

[Title 296 WAC—p. 2641]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-65404, filed 12/21/04, effective 4/2/05.]

### **WAC 296-307-656 Definitions.**

#### **Acceptable entry conditions:**

The conditions that must exist in a permit-required confined space to allow safe entry and work.

#### **Attendant:**

An individual stationed outside one or more permit-required confined spaces to monitor the entrants.

#### **Blanking or blinding:**

The absolute closure of a pipe, line, or duct by fastening a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore. It is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

#### **Confined space:**

A space that is **all** of the following:

- Large enough and arranged so an employee could fully enter the space and work.
- Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.
- Not primarily designed for human occupancy.

#### **Double block and bleed:**

The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

#### **Emergency:**

Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit-required confined space that could endanger authorized entrants.

#### **Engulfment:**

The surrounding capture of a person by a liquid or finely divided (flowable) solid substance that can be inhaled to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

#### **Enter (entry):**

The action by which a person passes through an opening into a permit-required confined space and includes work activities in that space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

**Note:** If the opening is large enough for the worker to fully enter the space, a permit is required even for partial body entry. Permits are not required for partial body entry where the opening is not large enough for full entry, although other rules such as lockout-tagout, WAC 296-307-320 or respiratory hazards, WAC 296-307-624 may apply.

#### **Entrant:**

An employee who is authorized by the employer to enter a permit-required confined space.

#### **Entry permit (permit):**

The written or printed document that is provided by you to allow and control entry into a permit-required confined space and that contains the information required in WAC 296-307-650, Permit entry procedures.

#### **Entry supervisor:**

The person (such as the employer, crew leader, or crew chief) responsible for:

- Determining if acceptable entry conditions are present at a permit-required confined space where entry is planned;
- Authorizing entry and overseeing entry operations; and
- Terminating entry as required.

#### **Hazardous atmosphere:**

An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit-required confined space), injury, or acute illness caused by one or more of the following:

- Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL).
- Airborne combustible dust at a concentration that meets or exceeds its LFL.

**Note:** This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52 m) or less.

- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.

• Atmospheric concentration of any substance which may exceed a permissible exposure limit. For additional information about atmospheric concentration, see chapter 296-62 WAC, Parts F, G, and I, General occupational health standards and WAC 296-307-624, Respiratory hazards.

**Note:** An airborne concentration of a substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this definition.

- Any other atmospheric condition that is immediately dangerous to life or health.

**Note:** You can find guidance on establishing acceptable atmospheric conditions for air contaminants, which have no WISHA-determined doses or permissible exposure limits using other sources of information, such as:

- Material safety data sheets required by WAC 296-307-550, Employer chemical hazard communication.
- Published information.
- Internal documents.

#### **Hot work permit:**

A written authorization to perform operations, for example, riveting, welding, cutting, burning, and heating, that can provide a source of ignition.

#### **Immediately dangerous to life or health (IDLH):**

Any of the following conditions:

- An immediate or delayed threat to life.
- Anything that would cause irreversible adverse health effects.
- Anything that would interfere with an individual's ability to escape unaided from a permit-required confined space.

**Note:** Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse twelve to seventy-two hours after exposure. The victim "feels normal" after recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health (IDLH).

#### **Inerting:**

The displacement of the atmosphere in a permit-required confined space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

**Note:** This procedure produces an IDLH oxygen-deficient atmosphere.

**Isolation:**

The process by which a permit-required confined space is removed from service and completely protected against the release of energy and material into the space by such means as: Blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

**Line breaking:**

The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

**Nonpermit confined space:**

A confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

**Oxygen deficient atmosphere:**

An atmosphere containing less than 19.5 percent oxygen by volume.

**Oxygen enriched atmosphere:**

An atmosphere containing more than 23.5 percent oxygen by volume.

**Permit-required confined space or permit space:**

A confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material with the potential for engulfing someone who enters.
- Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross section.
- Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.
- Contains any other recognized serious safety or health hazard that could either:
  - Impair the ability to self-rescue; or
  - Result in a situation that presents an immediate danger to life or health.

**Permit-required confined space program:**

An overall program for:

- Controlling and appropriately protecting employees from permit-required confined space hazards; and
- Regulating employee entry into permit-required confined spaces.

**Prohibited condition:**

Any condition in a permit-required confined space that is not allowed by the permit during the authorized entry period.

**Rescue service:**

The personnel designated to rescue employees from permit-required confined spaces.

**Retrieval system:**

The equipment used for nonentry rescue of persons from permit-required confined spaces, such as a retrieval line, full-body harness or wristlets, and a lifting device or anchor.

**Testing:**

The process of identifying and evaluating the hazards that entrants may be exposed to in a permit-required confined space. Testing includes specifying the tests that are to be performed in the permit-required confined space.

**Note:** Testing allows employers to devise and implement adequate controls to protect entrants during entry, and to determine if acceptable entry conditions are present.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-656, filed 12/21/04, effective 4/2/05.]

**Part Y-10  
Emergency Response**

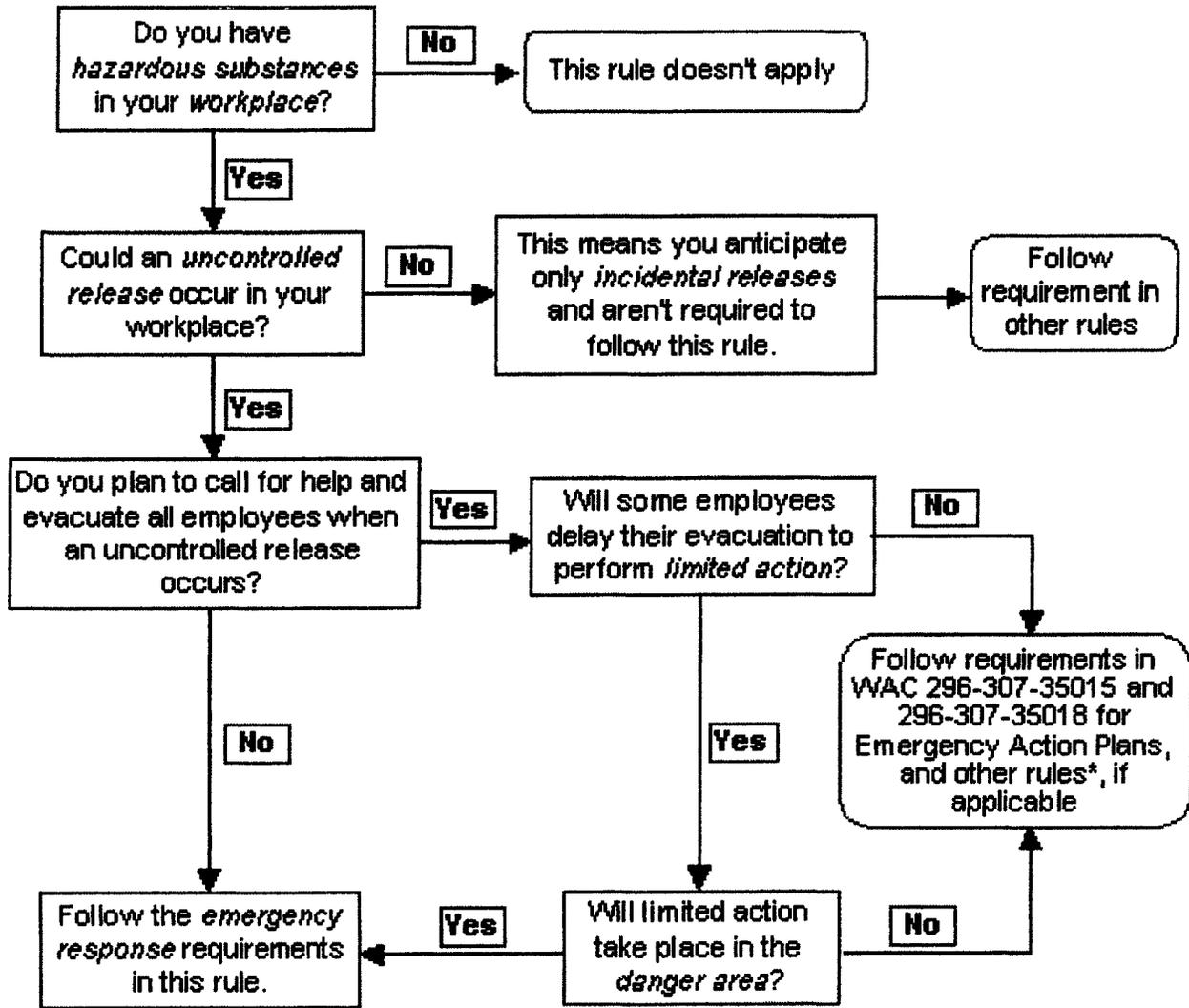
**WAC 296-307-704 Scope. What is the purpose of WAC 296-307-704, Emergency response to hazardous substance releases?**

To state the minimum requirements that help you protect the safety and health of your employees during a response to hazardous substance releases in your workplace or any other location.

**Do the requirements of this rule apply to your workplace?**

This section applies if your employees are, or could become, involved in responding to uncontrolled releases of hazardous substances in your workplace or any other location. Use the scope flow chart, and definitions that follow, to determine if this section applies to your workplace(s). Defined words are *italicized* in the flow chart.

307 - FLOWCHART



\*The flow chart references other rules applicable to your workplace depending on conditions and hazards.

Examples include:

- Chapter 296-828 WAC, Hazardous chemicals in laboratories
- WAC 296-307-594, Respiratory protection.

**Definitions applicable to the flow chart (see WAC 296-307-70480 for additional definitions used in this section):**

**Danger area**

Areas where conditions pose a serious danger to employees, such as areas where:

- Immediately dangerous to life or health (IDLH) conditions could exist

OR

- High levels of exposure to toxic substances could exist

OR

- There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

**Emergency response**

A response to an anticipated release of a hazardous substance that is, or could become, an *uncontrolled release*.

**Hazardous substance**

Any biological, radiological, or chemical substance that can have adverse effects on humans. (See WAC 296-307-70480 for a more specific definition.)

**Immediately dangerous to life or health (IDLH)**

Any atmospheric condition that would:

- Cause an immediate threat to life
- Cause permanent or delayed adverse health effects
- Interfere with an employee's ability to escape.

**Incidental release**

A release that can be safely controlled at the time of the release and does not have the potential to become an *uncontrolled release*.

Example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The

employer has trained the driver on procedures and provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

#### **Limited action**

Action necessary to:

- Secure an operation during emergency responses,

**OR**

- Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

#### **Release**

A spill, leak, or other type of hazardous substance discharge.

#### **Uncontrolled release**

A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

Examples of conditions that could create a significant safety and health risk:

- Large-quantity releases
- Small-releases that could be highly toxic
- Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

#### **Workplace**

- A fixed facility
- OR**
- A temporary location (such as a traffic corridor)
- OR**
- Locations where employees respond to emergencies.

#### **Summary:**

##### **Your responsibility:**

To anticipate, plan for, and manage emergency response operations so employees are protected from hazardous substances and conditions.

- Note:**
- Other chapters may apply to your workplace, such as:
  - Chapter 296-62 WAC, General occupational health standards.

You will find some safety and health requirements (for example, personal protective equipment) are addressed on a general level in the core rules, while being addressed for a

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specific application in this section. When this happens, both requirements apply and should not conflict.

If you are uncertain which requirements to follow, you must comply with the more protective requirement. Contact your local L&I office if you need assistance in making this determination.

#### **You must:**

WAC 296-307-70410 Planning

WAC 296-307-70415 Training

WAC 296-307-70420 Medical surveillance

WAC 296-307-70425 Keep records

WAC 296-307-70430 Incident requirements

WAC 296-307-70435 Implement and maintain an incident command system (ICS) (incident command system)

WAC 296-307-70440 Prepare skilled support personnel

WAC 296-307-70445 Make sure the incident commander oversees activities during the response

WAC 296-307-70450 Use the buddy system in danger areas

WAC 296-307-70455 Provide rescue and medical assistance

WAC 296-307-70460 Personal protective equipment

WAC 296-307-70465 Control hazards created by personal protective equipment (PPE)

WAC 296-307-70470 Use personal protective equipment (PPE) properly

WAC 296-307-70475 Postemergency response

WAC 296-307-70480 Definitions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-307-704, filed 1/3/06, effective 4/1/06; 05-01-166, § 296-307-704, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70410 Planning.** Develop an emergency response plan.

- Note:**
- You may already have an emergency response plan, such as required by chapter 296-843 WAC, Hazardous waste operations or by state and locally coordinated response efforts (Section 303 of Superfund Amendments and Reauthorization Act (SARA), Title III). You may use those plans to comply with this section, if they include the items listed below.
  - Before a written emergency response plan can be developed, you will need to anticipate the types of uncontrolled releases that employees could encounter in your workplace(s).

#### **You must:**

(1) Make sure your plan is written and adequately addresses, as a minimum, all of the following:

- Preemergency planning and coordination with additional responders (including personnel from other employers such as: Fire departments, law enforcement agencies, emergency medical services, and state or federal agencies).
- Personnel roles, (see Table 1) and lines of authority and communications for all affected parties including responders.
- Employee training (see WAC 296-307-70415, train your employees), for more detail:

- Note:**
- Responders' level of training depends on the duties and roles the employer assigns.
  - Training for the employees' role should address the competencies specified in Tables 3 through 6.
  - Training on specific substances may be appropriate depending on the number and characteristics of hazardous substances expected to be encountered. For example, if employees may only respond to one substance, you could provide training (covering the knowledge and skills speci-

fied in Tables 3 through 6) relevant to that single substance. If employees might respond to a range of hazardous substances, training may be required to cover categories of hazardous substances.

**You must:**

- Videos and automated training methods (for example: Interactive computer based programs) may be used in training; however, instructors must be readily available to:
  - Encourage and provide responses to questions for the benefit of the group
  - Evaluate employees' understanding of the material
  - Provide instructional interaction to the group.
- Emergency recognition
- Immediate emergency procedures including:
  - Methods of alerting employees (see WAC 296-307-345, Employee alarm systems) and outside responders
  - Procedures for limited action (emergency prevention).

**Note:** *Limited action* includes shutting down processes, closing emergency valves and other critical actions to secure the operation, or prevent the incident from increasing in severity.

<b>Limited Action and Employee Roles</b>	
<b>If . . .</b>	<b>Then employees involved would be:</b>
Limited action could be conducted in the danger area	Considered emergency responders
Limited action will not be conducted in IDLH conditions	Considered evacuees, not emergency responders

- Details of who will evacuate immediately and who will remain behind for limited action
- Evacuation routes and procedures
- How to establish safe distances and places of refuge (for example, during emergency response the incident commander (IC) decides to make changes based on new developments, i.e., changes in the wind direction).

**You must:**

- Methods of securing and controlling access to the site
- Emergency medical treatment and first aid

- A complete personal protective equipment (PPE) program that addresses:

- Selection of PPE including selection criteria to be used and the identification, specified use and limitations of the PPE selected
- Training on proper use of PPE (including maintenance)
- Hazards created by wearing PPE including heat stress during temperature extremes, and/or other appropriate medical considerations
- Criteria used for determining the proper fit of PPE
- Procedures covering proper use of PPE including procedures for inspection, putting it on (donning) and removing it (doffing)
- Maintenance of PPE including procedures for decontamination, disposal and storage
- Methods used to evaluate the effectiveness of your PPE program.

**Note:**

- If a manufacturer's printed information or WISHA rule adequately addresses procedural requirements (such as donning or doffing for PPE), it is not necessary to rewrite this into your program; simply attach the printed information.
- You may use written procedures provided by the equipment manufacturer when they meet the requirements of other chapters, including chapter 296-307 WAC, Part Y-5, Respirators.

- Emergency equipment
- Emergency response procedures
- Decontamination procedures determined by a hazardous materials specialist or other qualified individual
- Methods to critically assess the response and conduct appropriate follow-up.

**You must:**

- (2) Make your written emergency response plan available to employees, their representatives, and WISHA personnel for inspecting or copying.

**Note:** In situations where multiple employers could respond to an incident, all plans should consistently address:

- Who will be designated as the incident commander (IC)

**AND**

- If, when, and how transfer of the incident commander (IC) position will take place.

<b>Table 1 Roles and Duties of Emergency Responders</b>	
<b>If the employee's role is:</b>	<b>Then all the following apply. They:</b>
First responder at the awareness level	<ul style="list-style-type: none"> <li>• Are likely to witness or discover a hazardous substance release</li> <li>• Are trained to initiate an emergency response by notifying the proper authorities of the release</li> <li>• Take no further action beyond notifying the authorities</li> </ul>
First responder at the operations level	<ul style="list-style-type: none"> <li>• Respond to actual or potential releases in order to protect nearby persons, property, and/or the environment from the effects of the release</li> <li>• Are trained to respond defensively, without trying to stop the release</li> <li>• May try to:                             <ul style="list-style-type: none"> <li>- Confine the release from a safe distance</li> <li>- Keep it from spreading</li> <li>- Protect others from hazardous exposures</li> </ul> </li> </ul>
Hazardous materials technician	<ul style="list-style-type: none"> <li>• Respond to releases or potential releases, with the intent of stopping the release</li> <li>• Are trained to approach the point of release offensively in order to, either:                             <ul style="list-style-type: none"> <li>- Plug</li> <li>- Patch</li> <li>- Stop the release using other methods</li> </ul> </li> </ul>

<b>Table 1 Roles and Duties of Emergency Responders</b>	
<b>If the employee's role is:</b>	<b>Then all the following apply. They:</b>
Hazardous materials specialist	<ul style="list-style-type: none"> <li>• Respond along with, and provide support to, hazardous materials technicians</li> <li>• Are required to have more specific knowledge of hazardous substances than a hazardous materials technician</li> <li>• Act as the site activity liaison when federal, state, local, and other government authorities participate</li> </ul>
Incident commander	<ul style="list-style-type: none"> <li>• Have ultimate responsibility for:                             <ul style="list-style-type: none"> <li>- Direction</li> <li>- Control</li> <li>- Coordination of the response effort</li> <li>- Will assume control of the incident beyond the first responder awareness level</li> </ul> </li> </ul>
Specialist employee	<ul style="list-style-type: none"> <li>• Are a technical, medical, environmental, or other type of expert</li> <li>• May represent a hazardous substance manufacturer, shipper, or a government agency</li> <li>• May be present at the scene or may assist from an off-site location</li> <li>• Regularly work with specific hazardous substances</li> <li>• Are trained in the hazards of specific substances</li> <li>• Are expected to give technical advice or assistance to the incident commander or incident safety officer, when requested</li> </ul>
Skilled support personnel	<ul style="list-style-type: none"> <li>• Are needed to perform an immediate, specific emergency support task at the site</li> <li>• Are skilled in the operation of equipment including:                             <ul style="list-style-type: none"> <li>– Earth moving equipment</li> <li>– Cranes</li> <li>– Hoisting equipment</li> </ul> </li> </ul>
Incident safety officer	<ul style="list-style-type: none"> <li>• Are designated by the incident commander</li> <li>• Are knowledgeable in operations being implemented at the site</li> <li>• Have specific responsibility to                             <ul style="list-style-type: none"> <li>– Identify and evaluate hazards</li> <li>– Provide direction on employee safety matters</li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70410, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70415 Training.**

**Train your employees**

- Note:**
- Use Tables 3 through 6 to identify your employees' training competencies.
  - You may conduct training internally, or use outside training services to comply with this section.
    - When outside trainers are hired, you are still responsible for making sure the requirements of this section are met. For example, employers may compare the course outline to the competencies listed in Tables 3 through 6.

**You must:**

- Make sure employees are appropriately trained for their assigned roles and duties as follows:

**Exemption:** Skilled support employees are not covered by the training requirements of this section (see WAC 296-307-70440).

**Initial training:**

- Provide initial training before the employee is allowed to participate in an actual emergency response operation.

**Note:** When first responders at the awareness or operations level have sufficient experience to objectively demonstrate competencies specified in Table 3, you may accept experience instead of training.

- Make sure initial training adequately addresses the competencies in Tables 3 through 6 and the minimum training durations in Table 2.

- Certify that employees objectively demonstrate competencies specified in Tables 3 through 6 (except for employees trained as first responders at the awareness level).

**You must:**

(2007 Ed.)

**Retraining (refresher) training:**

- Provide retraining annually.
- Make sure retraining covers necessary content.
- Document training or demonstrated competency.

**Note:** Retraining is not required when employees demonstrate competencies annually and a record is kept of the demonstration methodology used.

**You must:**

**Trainer qualifications:**

- Verify trainers have satisfactorily completed an instructors' training course for the subjects they teach. For example, courses offered by the United States National Academy, or equivalent courses are acceptable.

**OR**

- Have the educational and instructional experience necessary for training.

**Specialist employees:**

- Specialist employees who have been sent to the scene to advise or assist must receive training or demonstrate competency in their specialty, annually.

<b>Table 2</b> <b>Minimum Training Durations for all Responders</b>	
<b>If you are a:</b>	<b>Then:</b>
First responder at the awareness level	Training duration needs to be sufficient to provide the required competencies
First responder at the operations level	You need a minimum of 8 hours training (see Table 3)
Hazardous materials technician	You need a minimum of 24 hours training (see Table 4)
Hazardous materials specialist	You need a minimum of 24 hours training (see Table 4)
Incident commander	You need a minimum of 24 hours training (see Table 5)

<b>Table 3</b> <b>Competencies for First Responders at the Awareness Level and Operations Level</b>		
<b>Employees must be able to show they:</b>	<b>When they are designated as First Responders at the:</b>	
	<b>Awareness Level</b>	<b>Operations Level</b>
Understand what hazardous substances are and their associated risks.	X	X
Recognize the presence of hazardous substances in an emergency.	X	X
Can identify the hazardous substances, when possible.	X	X
Understand the potential consequences of hazardous substances in an emergency.	X	X
Understand the role of a first responder at the awareness level as described in: <ul style="list-style-type: none"> <li>• The employer's emergency response plan, including site security and control.</li> <li>• The United States Department of Transportation's Emergency Response Guidebook. (<i>Search at: <a href="http://www.dot.gov">http://www.dot.gov</a></i>)</li> </ul>	X	X
Can use The United States Department of Transportation's Emergency Response Guidebook.	X	X
Recognize the need for additional resources and the need to notify the incident's communication center accordingly.	X	X
Know basic hazard and risk assessment techniques.		X
Can select and use personal protective equipment (PPE) appropriate for first responder operations level.		X
Understand basic hazardous materials terms.		X
Can perform basic control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can implement decontamination procedures to their level of training.		X
Understand relevant standard operating and termination procedures.		X

<b>Table 4</b> <b>Competencies for Hazardous Materials Technicians and Hazardous Materials Specialist</b>		
<b>Employees must be able to show they:</b>	<b>When they are designated as a Hazardous Materials:</b>	
	<b>Technician</b>	<b>Specialist</b>
Have the competencies specified for the first responder operations level. (See Table 3)	X	X
Can implement an employer's emergency response plan.	X	X
Can function within their assigned role in the incident command system.	X	X
Understand hazard and risk assessment techniques.	X	X
Understand basic chemical and toxicological terminology and behavior.	X	X
Can use field survey instruments and equipment to classify, identify, and verify materials at the incident.	X	X
Can select and use personal protective equipment (PPE) appropriate for hazardous materials technicians.	X	X
Can perform advance control, containment, and/or confinement operations within the capabilities of the resources and PPE available.	X	X
Can implement decontamination procedures to their level of training.	X	X
Understand termination procedures.	X	X
Can implement the local emergency response plan.		X

Table 4 Competencies for Hazardous Materials Technicians and Hazardous Materials Specialist		
Know of the state emergency response plan.		X
Can develop a site safety and control plan.		X
Understand chemical, radiological, and toxicological terminology and behavior.		X
Understand in-depth hazard and risk techniques.		X
Can use advanced survey instruments and equipment to classify, identify and verify materials at the incident.		X
Can select and use proper specialized chemical PPE given to hazardous materials specialists.		X
Can perform specialized control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can determine decontamination procedures.		X

Table 5 Competencies for Incident Commanders	
<b>Employees designated as Incident Commanders must be able to show they:</b>	
<ul style="list-style-type: none"> <li>• Have competencies specified for the First Responder Operations Level. (See Table 3.)</li> <li>• Know of the state emergency response plan and the Federal Regional Response Team.</li> <li>• Can implement the local emergency response plan.</li> <li>• Can implement the employer's emergency response plan.</li> <li>• Have knowledge of the incident command system (ICS) and understand how they relate to it.</li> <li>• Can implement the employer's ICS.</li> <li>• Understand the hazards and risks associated with employees working in chemical protective clothing.</li> <li>• Understand the importance of decontamination procedures.</li> </ul>	
<b>Note:</b> If the first employee arriving at the scene is not trained as an IC, they may take control of the incident within their designated role and training level.	

Table 6 Competencies for Specialist Employees	
<b>Employees designated as Specialist Employees must be able to show they:</b>	
<ul style="list-style-type: none"> <li>• Have current knowledge in their field regarding safety and health practices relating to the specific hazardous substances.</li> <li>• Have the knowledge of the ICS and understand how they relate to it.</li> <li>• Understand the care and use of personal protective equipment (PPE).</li> </ul>	

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70415, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70420 Medical surveillance. Provide medical surveillance to employees.**

**You must:**

(1) Provide medical surveillance for employees to comply with Tables 7 and 8, and the following:

- Make medical surveillance available at:
  - Reasonable times and places.
  - No cost to employees, including travel associated costs such as mileage, gas or bus fare if the employee is required to travel off site

**AND**

– Wages for additional time spent outside of employees' normal work hours.

• Make sure a licensed physician performs or supervises exams and procedures.

• Give complete information to the examining physician including:

- A copy of this section.
- A description of the employee's duties that relate to hazardous substance exposure.
- The hazardous substance exposure levels anticipated for the employee.

– A description of the personal protective equipment (PPE) the employee could use.

– Information available from previous medical examinations.

– The medical evaluation information required by chapter 296-307 WAC, Part Y-5, Respirators.

• Medical exams must include, at a minimum:

– A medical history.

– A work history (or updated history if on file).

– A special emphasis on:

■ Assessment of symptoms related to handling hazardous substances.

■ Health hazards.

■ Evaluation of fitness for duty (including the ability to wear any personal protective equipment (PPE) or other conditions that may be expected at the workplace).

– Other content as determined by the examining physician.

**Note:** The physician should consult the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* and the *Medical Management Guidelines for Acute Chemical Exposure* (search OSHA web site: <http://www.osha.gov>).

**You must:**

- (2) Obtain the physician's written opinion and give a copy to the employee that includes:
  - A statement of whether or not medical conditions were found which would increase the employee's risk for impairment during emergency response work or respirator use.
    - Do not include specific findings or diagnoses unrelated to occupational exposures.

- Limitations recommended to the employee's assigned work, if any.
  - Exam and test results if the employee requests this information.
  - A statement that affirms the employee has been confidentially informed of medical exam results (including medical conditions requiring follow-up).

<b>Table 7 Medical Surveillance for Employee Categories</b>	
<b>If the employee is covered by this section and is:</b>	<b>Then you must:</b>
<ul style="list-style-type: none"> <li>• Exposed for at least 30 days a year to health hazards or hazardous substances at or above the permissible exposure limit or published exposure levels (even when respirators are used),</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Required to wear a respirator for at least 30 days a year.*</li> </ul>	<ul style="list-style-type: none"> <li>• Offer standard medical surveillance as specified in Table 8.*</li> </ul>
<ul style="list-style-type: none"> <li>• A hazardous materials (HAZMAT) team member.</li> <li>• A hazardous materials specialist.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide standard medical surveillance as specified in Table 8.</li> </ul>
<ul style="list-style-type: none"> <li>• An emergency responder who shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances during an incident.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide incident-specific medical surveillance as specified in Table 8.</li> </ul>
<ul style="list-style-type: none"> <li>• Not an emergency responder and:                             <ul style="list-style-type: none"> <li>– May be injured.</li> <li>– Shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances.</li> <li>– May have been exposed to hazardous substances at concentrations above the permissible exposure limits (PELs) or the published exposure levels without appropriate PPE.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Offer incident-specific medical surveillance as specified in Table 8.</li> </ul>

\*Note: A medical evaluation for respirator use is required by chapter 296-307 WAC, Part Y-5, Respiratory protection, for those employees who have not been cleared for respirator use during medical surveillance activities.

<b>Table 8 Frequency of Exams and Consultations</b>	
<b>If the employee is covered by:</b>	<b>Then medical surveillance must include:</b>
<ul style="list-style-type: none"> <li>• Standard medical surveillance</li> </ul>	<p>Exams and consultations:</p> <ul style="list-style-type: none"> <li>• Before assignment.</li> </ul> <p><b>Note:</b> If the employee is a hazardous materials (HAZMAT) team member or a hazardous materials specialist, the employee must receive a baseline physical examination.</p> <ul style="list-style-type: none"> <li>• At least once every 12 months after their initial assignment unless the physician believes a shorter, or longer interval (but no more than 24 months) is appropriate.</li> <li>• Whenever employees are reassigned to an area where they will no longer be covered by medical surveillance and they have not been examined within the past 6 months.                             <ul style="list-style-type: none"> <li>• As soon as possible after an employee reports:                                     <ul style="list-style-type: none"> <li>– Signs or symptoms of possible overexposure to hazardous substances or health hazards.</li> <li>– Injury.</li> <li>– Exposure above the permissible exposure limits or published exposure levels.</li> </ul> </li> <li>• At the termination of their employment unless they were examined within the past 6 months.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Incident-specific medical surveillance</li> </ul>	<p>Medical consultations and exams:</p> <ul style="list-style-type: none"> <li>• As soon as possible following the incident or development of signs or symptoms.</li> <li>• At additional times, if the physician determines follow-up is medically necessary.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70420, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70425 Keep records.****You must:**

- Keep a record of:
  - Name and Social Security number of the employee receiving medical surveillance
  - Physicians' written opinions, recommended limitations, and results of examinations and tests
  - Any employee medical complaints regarding hazardous substance exposures
  - A copy of all information given to the examining physician (except a copy of this section).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70425, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70430 Incident requirements. Recognize emergencies and initiate a response.****You must:**

- Make sure employees follow procedures in your emergency response plan to:
  - Recognize when an emergency response must be initiated
  - Notify employees, and others designated in your plan, of the release
  - Follow immediate emergency procedures
  - Prevent the incident from increasing in severity or to secure the operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70430, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70435 Implement and maintain an incident command system (ICS).****You must:**

- (1) Make sure a single individual, acting as the incident commander (IC), is in charge of the site-specific incident command system (ICS) and acts within their designated role and training level.

- Note:**
- For multiemployer worksites:
    - The IC has responsibility for controlling emergency response operations at the site for all employers.
    - Emergency response plans should be consistent in designating who assumes the IC position.
  - If the first employee arriving at the scene is not trained as an IC (see Table 5, Training Requirements for Incident Commanders and Specialist Employees, WAC 296-307-70415), they may take control of the incident within their designated role and training level.

**You must:**

- (2) Make sure all employers' emergency responders and their communications are coordinated and controlled by the IC.

**Note:** The IC may delegate tasks to subordinates (within their training level).

**You must:**

- (3) Make sure each employer at the scene has designated a representative to assist the IC.
- (4) Establish security and control of the site as specified in your written emergency response plan.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70435, filed 12/21/04, effective 4/2/05.]

(2007 Ed.)

**WAC 296-307-70440 Prepare skilled support personnel.**

**Note:** The duties of skilled support personnel are described in Table 1, Roles and Duties of Emergency Responders.

**You must:**

- (1) Make sure that your skilled support personnel (including those employees who are not regularly employed by you) who could be exposed to on-scene hazards are given an initial briefing at the site before they participate in any emergency response. The initial briefing must include:
  - What chemical hazards are involved
  - What duties are to be performed
  - Instruction in the wearing of appropriate personal protective equipment.

**Note:** Skilled support personnel do not need to comply with the other training requirements of this section.

**You must:**

- (2) Make sure the safety and health precautions given to your employees are also given to skilled support personnel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70440, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70445 Make sure the incident commander oversees activities during the response. The employer of the incident commander (IC) must:**

- (1) Identify all hazardous substances and conditions present, within their training level, using site analysis and maximum exposure limits, when appropriate.
- (2) Implement emergency response procedures appropriate to the hazardous substances and conditions present, such as:

- Procedures that address the use of engineering controls, hazardous substance handling, and new technologies
- Procedures that address decontamination
- Procedures that address PPE
- Procedures that limit the number of personnel to those who are actively performing emergency response operations, in areas where exposure could exist.

- (3) Designate an incident safety officer (ISO).

- Make sure the ISO demonstrates knowledge about operations being implemented at the emergency response site. They must:

- Identify and evaluate hazards
- Communicate with the IC about hazards, immediately informing the IC of corrective actions that must be taken when conditions are judged to be:

■ An imminent danger

**OR**

■ Immediately dangerous to life or health (IDLH).

- Provide direction about the safety of operations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70445, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70450 Use the buddy system in danger areas.****You must:**

- Make sure operations and tasks (including limited actions) in danger areas are conducted using the buddy system in teams of two or more.

**Definition:**

Danger areas are areas where conditions pose a serious danger to employees, such as areas where:

- Immediately dangerous to life or health (IDLH) conditions could exist.

**OR**

- High levels of exposure to toxic substances could exist.

**OR**

- There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL) of a hazardous substance.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70450, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70455 Provide rescue and medical assistance.**

**You must:**

(1) Provide stand-by employees equipped with the same level of personal protective equipment (PPE) as the entrants, for assistance or rescue.

- Note:**
- The buddy system applies to stand-by employees (WAC 296-307-70450).
  - One of the two stand-by employees can be assigned to another task provided it does not interfere with the performance of the stand-by role.
  - Rescue equipment should be selected and provided based on the types of rescue situations that could occur.

**You must:**

(2) Make sure employees trained in first aid are readily available with necessary medical equipment and have a way to transport the injured.

- Note:**
- Employers who require their employees to provide first aid must comply with the bloodborne pathogen rule, chapter 296-823 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70455, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70460 Personal protective equipment.**

- Note:**
- Only properly trained employees should select PPE. Hazardous materials technicians and hazardous materials specialists can select PPE within the competencies specified in Table 4.
  - Selection requirements in other PPE rules also apply, including:
    - Chapter 296-307 WAC, Part Y-5, Respirators.
    - Chapter 296-305 WAC, Safety standards for fire fighting.

**You must:**

- Provide employees with appropriate PPE and make sure it is used if hazards could be present.
- Select PPE (such as respirators, gloves, protective suits and other PPE) based on:
  - An evaluation of the performance characteristics (such as breakthrough time and hazardous substance-specificity of the material or item) relevant to the requirements and limitations of the site.
  - Task-specific conditions and durations.
  - The hazards and potential hazards of the site (see Table 9, Selecting PPE for Specific Hazards).
- Select totally encapsulating chemical protective (TECP) suits, as specified in Table 9, that:
  - Maintain positive air pressure.
  - Prevent inward test gas leakage of more than 0.5 percent.

- Note:**
- Follow the manufacturer's recommended procedure for testing a TECP suit's ability to maintain positive air pressure and prevent inward gas leakage. Other established test protocols for these suits, for example NFPA 1991 and ASTM F1052-97, may also be used.

<b>Table 9 Selecting PPE for Specific Hazards</b>	
<b>If:</b>	<b>Then use:</b>
<ul style="list-style-type: none"> <li>• Inhalation hazards could be present.</li> </ul>	<ul style="list-style-type: none"> <li>• Positive-pressure (pressure-demand) self-contained breathing apparatus (SCBA)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• A decreased level of respiratory protection only when the incident commander determines, from air monitoring results, that employees will be adequately protected.</li> </ul>
Chemical exposure levels will create a substantial possibility of: <ul style="list-style-type: none"> <li>• Immediate death.</li> <li>• Immediate serious illness or injury.</li> <li>• Reduced ability to escape.</li> </ul>	Either positive-pressure (pressure-demand): <ul style="list-style-type: none"> <li>• SCBA</li> <li>• Air-line respirators equipped with an escape air supply.</li> </ul>
Skin absorption of a hazardous substance may result in a substantial possibility of: <ul style="list-style-type: none"> <li>• Immediate death.</li> <li>• Immediate serious illness or injury.</li> <li>• Reduced ability to escape.</li> </ul>	Protection equivalent to Level A including a totally encapsulating chemical protective (TECP) suit.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70460, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70465 Control hazards created by personal protective equipment (PPE).**

**You must:**

- Control hazards created by the use of PPE, including:
  - Heat stress due to extremely high temperatures.
  - Any other employee health hazard and consideration.

[Title 296 WAC—p. 2652]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70465, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70470 Use personal protective equipment (PPE) properly.**

**You must:**

(2007 Ed.)

(1) Make sure employees inspect PPE before, during and after use, following your plan's procedures.

(2) Make sure employees put on (don) and remove (doff) PPE following your plan's procedures.

(3) Make sure employees do not interchange self-contained breathing apparatus (SCBA) air cylinders from different manufacturers, unless all of the following apply:

- There is a life-saving emergency
- You need a supplemental air supply
- The cylinders are of the same capacity and pressure rating.

(4) Make sure compressed air cylinders used with SCBAs meet the testing and service life requirements of the United States Department of Transportation (USDOT). Search at: <http://www.dot.gov>.

**Note:** You can also check with the cylinder manufacturers to obtain USDOT test and service life specifications.

**You must:**

(5) Make sure PPE is maintained in a safe and reliable condition using your plan's procedures. PPE maintenance includes:

- Decontamination
- Cleaning

- Inspection
- Identification of damage or defects
- Parts repair or replacement
- Storage or disposal.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70470, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70475 Postemergency response.**

**IMPORTANT:**

Postemergency response is the stage of the emergency response where the immediate threat from the release has been stabilized or eliminated, and cleanup of the site has started.

When cleanup is done by the employees who were part of the initial emergency response, the employees are not covered by this section (however, training, PPE and other requirements in WAC 296-307-70460 through 296-307-70470 apply to these employees).

**You must:**

- (1) Follow Table 10 to determine which requirements apply to your postemergency response activities.
- (2) Maintain clean-up equipment as specified in Table 10.

<b>Table 10</b>	
<b>Rules that Apply to Postemergency Response Activities</b>	
<b>When postemergency response cleanup is performed by employees who were not part of the initial emergency response and:</b>	<b>The following rules or requirements apply:</b>
It is necessary to remove hazardous substances, health hazards and contaminated materials (example: Soil) from the site.	Chapter 296-843 WAC, Hazardous waste operations.
Cleanup is done on plant property using plant or workplace employees <b>AND</b> It is not necessary to remove hazardous substances, health hazards and contaminated materials from the site.	For training: <ul style="list-style-type: none"> <li>• WAC 296-307-35015 and 296-307-35018, Employee emergency action plans</li> <li>• Chapter 296-307 WAC, Part Y-5, Respiratory protection</li> <li>• WAC 296-307-550, Employer chemical hazard communication</li> <li>• Other appropriate training requirements relevant to personal protective equipment (PPE) and decontamination</li> </ul> For equipment: <ul style="list-style-type: none"> <li>• Make sure that all equipment used for clean-up work is serviced and inspected before use.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-166, § 296-307-70475, filed 12/21/04, effective 4/2/05.]

**WAC 296-307-70480 Definitions.** The following definitions are specific to this section:

**Annually**

Any twelve-month cycle.

**Buddy system**

A system of organizing employees (who enter or stand by danger areas) into work groups, so each employee can be observed by at least one other member of the group. The purpose of this system is to provide rapid assistance to employees in an emergency.

**Clean-up operation(s)**

An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared up or, in any other manner, processed or handled with the goal of making the site safer for people or the environment.

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**Danger area**

Areas where conditions pose a serious danger to employees, such as areas where:

- Immediately dangerous to life or health (IDLH) conditions could exist

**OR**

- High levels of exposure to toxic substances could exist

**OR**

- There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

**Decontamination**

Removing hazardous substances from employees and their equipment so potential adverse health effects will not occur.

[Title 296 WAC—p. 2653]

**Emergency response**

An organized response to an anticipated release of a hazardous substance that is, or could become, an uncontrolled release.

**Emergency response plan**

A written plan that requires coordination between emergency response participants, and contains procedures, criteria, and other information that will be applied to emergency response operations. Each employer's plan should be compatible with local and state plans.

**Engineering controls**

Methods of controlling employee exposures by modifying the source or reducing the quantity of contaminants.

**Hazardous materials team (HAZMAT team)**

A group of employees who are expected to perform responses to releases, or possible releases, of hazardous substances for the purpose of control and stabilization. As a result of their duties, HAZMAT team members may have close contact with hazardous substances.

**Note:** A HAZMAT team may be a separate component of a fire brigade or fire department.

**Hazardous substance**

Any of the following substances that could adversely affect an exposed employee's health or safety:

- Substances defined under section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) or "Superfund" Act (visit: <http://www.epa.gov>)

- Biological or other disease-causing agents released that could reasonably be expected to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in a person or their offspring when the person:
  - Is directly exposed to the agent in the environment
  - Directly ingests, inhales, or assimilates the agent from the environment
  - Indirectly ingests the agent through a food chain

- Substances listed by the United States Department of Transportation as hazardous materials under Title 49 (Transportation) in the Code of Federal Regulations (CFR), Part 172, section 101 and appendices (visit: <http://www.nara.gov> and search for "List of CFR subjects")

- Hazardous wastes as defined in this section.

**Hazardous waste**

A substance designated by chapter 173-303 WAC, Dangerous waste regulations, department of ecology, as a dangerous waste or an extremely hazardous waste and any waste fitting the definition of "health hazard" in this section.

**Note:** For department of ecology regulations, visit: <http://www.ecy.wa.gov>.

**Health hazard**

A chemical, a mixture of chemicals, or a pathogen for which there is statistically significant evidence, based on at least one study conducted according to established scientific principles, that acute or chronic health effects may occur in exposed employees.

The term "health hazard" includes stress due to temperature extremes and chemicals that are:

- Carcinogens

- Toxic or highly toxic agents
- Reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, or neurotoxins
  - Agents acting on the hematopoietic system agents that damage lungs, skin, eyes, or mucous membranes. (Detailed definitions of these chemical terms can be found in the Safety and health core rules, WAC 296-307-550, chemical hazard communication.)

**Immediately dangerous to life or health (IDLH)**

Any atmospheric condition that would:

- Cause an immediate threat to life

**OR**

- Cause permanent or delayed adverse health effects

**OR**

- Interfere with an employee's ability to escape.

**Incident command system (ICS)**

An organized approach to control and manage operations at an emergency response incident.

**Incidental release**

A release that can be safely controlled at the time of the release and does not have the potential to become an uncontrolled release.

**Note:** Example of a situation that results in an incidental release: A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

**Limited action**

Action necessary to:

- Secure an operation during emergency responses,

**OR**

- Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

**Lines of authority**

A preestablished ranking of individuals, qualified to assume a commanding role during an emergency response, noted in an emergency response plan and implemented during a response. This is most important when responders from multiple employers could participate in an emergency response.

**Lower explosive limit (LEL)**

See lower flammable limit (LFL).

**Lower flammable limit (LFL)**

The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent (by volume) of the material in air (or other oxidant).

**Must**

Must means mandatory.

**Permissible exposure limit (PEL)**

Means the established time-weighted-average (TWA) concentration or ceiling concentration of a contaminant that must not be exceeded.

The exposure, inhalation, or dermal permissible limit specified in chapter 296-307 WAC, Part Y-6, Respiratory hazards.

**Personal protective equipment (PPE)**

Protective items designed to be worn by the user to protect them against airborne, skin contact and other hazards.

This includes items such as respiratory protection, protective suits, gloves, eye protection, etc.

**Postemergency response**

The stage of the emergency response where the immediate threat from the release has been stabilized or eliminated, and cleanup of the site has started.

**Published exposure level**

Exposure limits published in "National Institute for Occupational Safety and Health (NIOSH) Recommendations for Occupational Safety and Health" (DHHS publication #92-100, 1992).

If an exposure limit is not published by NIOSH, then "published exposure level" means the exposure limits published by the American Conference of Governmental Industrial Hygienists (ACGIH) in "TLVs and BEIs-Threshold Limit Values for Chemical Substances and Physical Agents" (1999 edition).

**Note:** Additional exposure levels published by recognized organizations such as the American Industrial Hygiene Association are not required to be observed by this rule; however, they may be a useful resource when a hazardous substance is not covered by NIOSH and ACGIH publications.

**Release**

A spill, leak, or other type of hazardous substance discharge.

**Uncontrolled release**

A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

Examples of conditions that could create a significant safety and health risk:

- Large-quantity releases
- Small releases that could be highly toxic

Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

**Workplace**

- A fixed facility
- OR**
- A temporary location (such as a traffic corridor)
- OR**
- Locations where employees respond to emergencies.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-166, § 296-307-70480, filed 12/21/04, effective 4/2/05.]

**Chapter 296-310 WAC**

**FARM LABOR CONTRACTING RULES**

**WAC**

296-310-010	Definitions.
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296-310-240	Adjustment of controversies.
296-310-250	Filing and service.
296-310-260	Liability of person who uses services of unlicensed contractor.
296-310-270	Inspection of records.

**WAC 296-310-010 Definitions.** For the purposes of this chapter:

(1) "Agricultural employee" means any person who renders personal services to, or under the direction of, an agricultural employer in connection with the employer's agricultural activity.

(2) "Agricultural employer" means any person engaged in agricultural activity, including the growing, producing, or harvesting of farm or nursery products, or engaged in the reforestation or reforestation of lands, which includes but is not limited to the planting, transplanting, tubing, precommercial thinning, and thinning of trees and seedlings, the clearing, piling, and disposal of brush and slash, the harvest of Christmas trees, and other related activities.

(3) "Bonded contractor" means a contractor who obtained a surety bond in order to comply with RCW 19.30-030(5).

(4) "Contractor" means a farm labor contractor.

(5) "Department" means the department of labor and industries.

(6) "Director" means the director of the department of labor and industries.

(7) "Employee" means an agricultural employee.

(8) "Farm labor contractor" means any person, or his or her agent or subcontractor, who, for a fee, performs any farm labor contracting activity.

(9) "License" means a farm labor contractor license.

(10) "Secured contractor" means a contractor who assigned a savings account to, or deposited cash or other security with, the department in order to comply with RCW 19.30.030(5).

(11) "Security" means a savings account assigned to, or cash or other security deposited with, the department.

[Statutory Authority: RCW 19.30.130, 86-01-027 (Order 85-34), § 296-310-010, filed 12/11/85.]

**WAC 296-310-020 Application for initial and renewed licenses.** (1) To obtain a license, a contractor must:

- (a) Complete an application for a license;
- (b) Provide the information required by RCW 19.30.030 (1), (6), and (7);
- (c) Obtain a surety bond or provide other acceptable security to the department. If the contractor obtains a bond, it must submit the original bond to the department;
- (d) Obtain insurance and supply the information required by WAC 296-310-040(2) if the contractor seeks a license to transport workers; and
- (e) Pay the fee set by WAC 296-310-060.

(2) The department shall send a renewal notice to the contractor's last recorded address at least forty-five days before the contractor's license expires. The contractor may renew its license if it submits the renewal notice and provides the materials required in subsection (1)(b), (c), (d) if appropriate, and (e) of this section.

(3) The contractor must submit all materials to the department in one package. Each of the materials must name the contractor exactly as it is named on the application for license or the renewal notice. If the contractor is renewing its license, each of the materials must include the contractor's license number. If any of the materials are missing, do not properly name the contractor, or do not include the license number, the department shall refuse to license or renew the license of the contractor.

(4) The bond and the insurance policy must expire no sooner than the expiration date of the license for which the contractor has applied.

(5) Applications for issuance or renewal of a license must be sent to:

Department of Labor and Industries  
ESAC Division  
General Administration Building  
Olympia WA 98504

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-020, filed 12/11/85.]

**WAC 296-310-030 Denial of license.** (1) The department may refuse to issue or renew a license for the reasons listed in RCW 19.30.050 and 19.30.060. If the department refuses a license for any of these reasons, it shall serve on the contractor a notice of denial of license. The notice of denial of license shall:

- (a) Describe concisely the ground for denial of the license; and
- (b) Specify the statutory authority for the denial.

The notice of denial shall inform the contractor that it may request a hearing pursuant to WAC 296-310-160 on the denial. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order denying the license.

(2) The department also shall refuse to issue a license to or renew the license of a contractor who fails to comply with WAC 296-310-020. The department shall inform the contractor of the problem either in writing or, if appropriate, orally. Because compliance with WAC 296-310-020 involves tech-

nical requirements that are entirely within the control of the contractor, no hearing shall be granted on a failure to comply.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-030, filed 12/11/85.]

**WAC 296-310-040 Requirements for a license to transport employees.** (1) A contractor who intends to transport employees must obtain liability insurance. The department shall require public liability and property damage insurance that provides coverage, for each single occurrence and for each vehicle used to transport employees, in the following minimum amounts:

- (a) \$50,000 for injury or damage to property;
- (b) \$100,000 for injury or damage, including death, to any one person; and
- (c) \$500,000 for injury or damage, including death, to more than one person.

(2) The contractor must also provide to the department evidence of the insurance policy or policies.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-040, filed 12/11/85.]

**WAC 296-310-050 Amount of bond or security.** (1) A contractor must provide a bond or security in the following minimum amount:

(a) If the contractor employs or intends to employ:

- |  |          |
|--|----------|
| (i) From one to ten employees:                 | \$ 5,000 |
| (ii) From eleven to fifty employees:           | \$10,000 |
| (iii) From fifty-one to one hundred employees: | \$15,000 |
| (iv) Over one hundred employees:               | \$20,000 |

(b) If the contractor does not employ agricultural employees, but only recruits, solicits, supplies, transports, or hires employees for another person, and that person takes complete responsibility for payment of wages to the employees, the contractor shall obtain a \$5,000 bond or other security.

(2) If the contractor obtains a two-year license, the bond or security shall be twice the minimum amounts stated in subsection (1) of this section.

(3) The department may order the contractor to obtain a bond or security for an amount greater than the minimums set by subsections (1) and (2) of this section if the security or bond is insufficient to satisfy the contractor's potential liability for the license period. If the department determines that an increased bond is necessary, it shall serve on the contractor a notice to increase bond or security. The notice shall:

- (a) Describe concisely the reasons an increase in the bond or security is necessary;
- (b) Specify the statutory authority for the required increase; and

(c) Grant the contractor thirty days from the date of issuance of the notice to obtain and provide to the department the increased bond or security.

The notice shall inform the contractor that it may request a hearing pursuant to WAC 296-310-160 on the order to increase the bond or security. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order requiring the contractor to submit the increased bond or security. The notice shall also specify that, if the con-

tractor neither appeals nor obtains the increased bond or security within the thirty days, the department shall suspend the contractor's license.

(4) If the director issues a final, unappealed decision raising the amount of the bond or security, the raised amount shall be required for all license periods after the date of issuance of the final decision unless the decision specifically states otherwise. A contractor may, if the circumstances that led to the increased amount change, file with the department a written petition to lower the amount. The petition shall specify the grounds that justify a lowering of the bond or security. The department shall investigate the petition and shall issue a new notice stating its decision on the bond amount. The contractor, if aggrieved, may appeal this new notice as provided in subsection (3) of this section.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-050, filed 12/11/85.]

**WAC 296-310-060 Fees.** (1) The fee for a one-year license is:

(a) For a contractor engaged in forestation or reforestation:	\$100.00
(b) For all other contractors:	\$ 35.00
(2) The fee for a two year license is:	
(a) For a contractor engaged in forestation or reforestation:	\$200.00
(b) For all other contractors:	\$ 70.00

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-060, filed 12/11/85.]

**WAC 296-310-070 Duplicate licenses.** If a contractor loses its license, or if the license is stolen or destroyed, the contractor may obtain a duplicate license upon application to the department. The application must specify the reason a duplicate is necessary.

The duplicate license shall be stamped prominently with the word "duplicate." A new contractor license number shall be supplied to the contractor.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-070, filed 12/11/85.]

**WAC 296-310-080 Length of license period.** A contractor who is obtaining its initial license shall be licensed for one year only. A contractor who is renewing its license may choose to obtain either a one-year or two-year license, unless the department informs the contractor that it may obtain only a one-year license.

All one-year licenses shall expire on December 31 of the year of issuance. All two-year licenses shall expire on December 31 of the year following the year of issuance.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-080, filed 12/11/85.]

**WAC 296-310-090 Change in business structure, name, address, or number of employees.** (1) If a contractor changes its business structure (for example, if it changes from a partnership to a corporation, or if the partners in a partnership change), the contractor must apply for a new license in the manner required by WAC 296-310-020. If a contractor

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does not obtain a new license after a change in its business structure, its previous license may be invalid.

(2) If a contractor changes its name or address, it must notify the department within ten days.

(3) If a contractor begins employing agricultural employees, or increases the number of its employees, so that the bond or security is insufficient for that number of employees, the contractor must obtain a new bond or security in the amount required by WAC 296-310-050 and submit it to the department. The department need not issue a notice to increase the amount of bond or security in this situation.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-090, filed 12/11/85.]

**WAC 296-310-100 Cancellation of insurance or bond.** (1) No surety company may cancel any bond issued to a contractor pursuant to RCW 19.30.040, unless the contractor previously submits another bond or other security, for the same amount, that covers the contractor's liability for the same period as that for the bond that is to be cancelled.

(2) A cancellation of a surety bond or insurance policy is effective thirty days after the department receives the cancellation notice, if the cancellation notice contains the following information:

- (a) The name of the contractor, exactly as it appears on the contractor's license;
- (b) The contractor's license number;
- (c) The contractor's business address;
- (d) The number of the bond or insurance policy that is to be cancelled;
- (e) The effective date of the bond or insurance policy that is to be cancelled; and

(f) If the cancellation is of a surety bond, a certification that the contractor has previously obtained and submitted to the department a new bond or other security as required by subsection (1) of this section.

(3) To help the department process cancellations, the information in subsection (2) of this section should be provided in the order shown.

(4) The insurance and bonding companies should send cancellation notices to the department by certified or registered mail.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-100, filed 12/11/85.]

**WAC 296-310-110 Refund of security deposited with the department.** (1) If a contractor is secured, the department shall release its interest in the security three years after the contractor's last license expired. The department shall not release its interest, however, if an unsatisfied judgment or claim is outstanding against the contractor.

(2) The department shall in any case release its interest in the security if the contractor provides a surety bond in the same amount that covers all of the periods in which the contractor was licensed for the previous three years, plus for the contractor's current license period if applicable.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-110, filed 12/11/85.]

**WAC 296-310-120 Revocation or suspension of license.** (1) The department may revoke a contractor's license for the reasons listed in RCW 19.30.050(1) and 19.30.060. If the department revokes a license, it shall serve on the contractor a notice of revocation. The notice of revocation shall:

- (a) Describe concisely the ground for the revocation; and
- (b) Specify the statutory authority for the revocation.

The notice of revocation shall inform the contractor that it may request a hearing on the revocation. The notice shall specify that if no hearing is requested within thirty days after the date of issuance of the notice, the director shall issue a final, unappealable order revoking the contractor's license. The hearing may be requested pursuant to WAC 296-310-160.

(2) A contractor is entitled to retain its license only if it remains in compliance with the bonding and insurance requirements of RCW 19.30.030 and 19.30.040. If a contractor's surety bond or other security is impaired or becomes insufficient, the contractor's insurance policy is cancelled, or the contractor transports employees without insurance, the department shall suspend the contractor's license until the contractor obtains a new bond, other security, or insurance policy, eliminates the impairment to the bond or security, or ceases to transport workers. The contractor may not do business while its license is suspended.

The department shall inform the contractor in writing of the suspension and of the steps the contractor must take to remove the suspension. The contractor may not appeal a suspension of licensing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-120, filed 12/11/85.]

**WAC 296-310-130 Submission of complaint.** Any person may submit to the department a complaint alleging a violation of chapter 19.30 RCW or challenging an application for a license. The complaint must describe the alleged violation or ground for denying a license, and must identify the alleged violator or applicant. It would aid the department's investigation if the complaint also specifies:

- (1) The name and address of the complainant; and
- (2) The address of the alleged violator or applicant.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-130, filed 12/11/85.]

**WAC 296-310-140 Investigation of complaint.** The department shall investigate a complaint unless the complaint was submitted more than three years after the date of the alleged violation. The department shall not investigate any complaint filed more than three years after the date of the violation.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-140, filed 12/11/85.]

**WAC 296-310-150 Notice of violation.** (1) If the department determines that there is reasonable cause to believe that chapter 19.30 RCW has been violated, the department shall serve on the violator a notice of violation. The notice of violation shall:

- (a) Describe concisely the violation;
- (b) Specify which statute was violated;

(c) If known, identify the employees who were affected by the violation;

(d) If known and applicable, state the amount of unpaid wages or damages the violator owes;

(e) State the penalty, if any, the department will assess for the violation; and

(f) State whether the contractor's license is being revoked as a result of the violation.

(2) If the notice alleges that the contractor owes unpaid wages or damages, the department shall serve a copy of the notice of violation on the violator's surety bond company.

(3) The notice of violation shall inform the violator and, if applicable, its surety that they may request a hearing on the violation, the amount of unpaid wages or damages owed, or the penalty assessed. The notice shall specify that if no hearing is requested within thirty days after the date the notice was issued the director shall issue a final, unappealable order finding that the violation did occur, ordering the violator to pay any unpaid wages or damages, and assessing penalties.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-150, filed 12/11/85.]

**WAC 296-310-160 Appeal of notices.** (1) The contractor or violator, or the violator's surety if the surety has an interest in the matter, may request a hearing on the matter asserted in a notice of denial of license, a notice of revocation, a notice of increased bond amount, or a notice of violation. One original and four copies of the request must be filed with the director within thirty days after the date the department issued the notice. A party requesting a hearing on a notice of violation must also serve a copy of the request on the surety or the violator as appropriate.

(2) The request for hearing must be in writing and must specify:

(a) The name and address of the party requesting the hearing;

(b) The name and date of issuance of the notice that is being appealed;

(c) The matters contained in the notice that the requestor believes are erroneous;

(d) The reasons the notice is erroneous; and

(e) If a surety is appealing a notice of violation, the name and address of the violating contractor.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-160, filed 12/11/85.]

**WAC 296-310-170 Hearing on appeal of notice.** (1) The director may hear an appeal personally or may delegate the authority to hold the hearing and draft a proposed decision to an administrative law judge pursuant to chapter 34.12 RCW. The plaintiff at the hearing shall be the department and the defendants shall be the contractor or the violator and its surety. The department shall have the burden of proving, by a preponderance of the evidence, that the matters stated in the notice occurred.

(2) Any person who has standing may, upon motion, be allowed to intervene as a plaintiff in a hearing on a notice of violation. Any interested person, whether or not admitted as a plaintiff, may submit written arguments and affidavits in any hearing.

(3) The hearing shall be conducted in accordance with the uniform procedure rules, chapter 1-08 WAC.

(4) If the director presides over the hearing, the director shall issue a final decision that includes findings of fact and conclusions of law and, if appropriate for a violation, an order to pay unpaid wages, damages, or a penalty.

(5) If an administrative law judge presides over the hearing, she or he shall issue a proposed decision that includes findings of fact and conclusions of law and, if appropriate for a violation, an order to pay unpaid wages, damages, or a penalty. The proposed decision shall be served on the contractor or the violator and its surety, the department, and any persons who have intervened as plaintiffs. Any of these parties, if aggrieved by the proposed decision, may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts. A copy of the proposed decision shall also be mailed to all persons who submitted written arguments or affidavits at the hearing.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous. The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a department employee to prepare a summary of the record for the department to review. The director may allow the parties to present oral arguments as well as the written arguments. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties. The director shall also mail a copy of the final decision to all persons who submitted written arguments or affidavits at the hearing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-170, filed 12/11/85.]

**WAC 296-310-180 Effect of final decision.** If the director issues a final decision that includes a finding that a violator owes unpaid wages or damages, and the finding is not appealed or is affirmed by the courts, the finding and the decision are res judicata in any action by the department, or by any other person who was a plaintiff at the hearing, against the violator and its surety to recover the unpaid wages or

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damages. The finding and decision are not res judicata in any action by a person who was not a party at the hearing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-180, filed 12/11/85.]

**WAC 296-310-190 Suit by department for unpaid wages or damages.** (1) RCW 19.30.160(4) authorizes the department to sue a violator and its surety on behalf of an employee to recover unpaid wages and other damages. The department is not required to bring suit and, in its sole discretion, may decide not to do so in any case. The department also shall not sue on behalf of any employee who has already brought a suit against the violator and its surety in the matter.

(2) The department may file a suit against the violator and its surety at any time and without regard to whether administrative proceedings have been exhausted.

(3) The department may include in any suit a request for an injunction against the violator.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-190, filed 12/11/85.]

**WAC 296-310-200 Procedures for filing suit against a contractor.** (1) A suit against a contractor and its bond or security for unpaid wages or damages may be brought in any court with jurisdiction. The venue may be in the county in which the claim arose, or in which either the damaged person or the defendant resides.

(2) When a contractor is sued, the plaintiff must serve the summons and complaint on the contractor and its surety by serving three copies of the summons and complaint by certified or registered mail on the department. The department shall not accept personal service of the summons and complaint.

(3) The department may be unable to process a summons and complaint if the summons and complaint do not contain the following information:

- (a) The contractor's name exactly as it appears on the contractor's license;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor; and
- (d) The contractor's license number.

If the suit names a surety as a defendant, the summons and complaint should also include:

- (e) The name and address of the surety that issued the contractor's bond;
- (f) The bond number; and
- (g) The effective date of the bond.

If the information is insufficient for the department to identify the contractor or surety that is being sued, the department shall not attempt to serve the summons and complaint and shall return them to the plaintiff.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-200, filed 12/11/85.]

**WAC 296-310-210 Collection of judgments.** (1) If a contractor is secured, a plaintiff who has received a final judgment against a contractor may satisfy the judgment out of the security held by the department.

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(2) The department shall satisfy a final judgment if the plaintiff serves on the department three certified copies of the unsatisfied judgment. The plaintiff must include the following information with the copies of the judgment:

- (a) The name of the contractor, exactly as it appears on the contractor's license;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor;
- (d) The contractor's license number; and
- (e) The exact amount of the judgment awarded by the court, including attorney's fees and interest.

If the department does not receive sufficient information to enable it to pay the judgment, it shall inform the plaintiff that more information is needed.

(3) If a contractor is bonded, a plaintiff can satisfy a final judgment only against the contractor or the bonding company. The department can neither satisfy the judgment nor, unless the department itself is the plaintiff, force the contractor or the bonding company to pay the judgment. The plaintiff must join the bonding company in the suit if it wants the bonding company to pay the judgment.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-210, filed 12/11/85.]

**WAC 296-310-220 Priority for payment of judgments.** RCW 19.30.170 contains two different provisions for priority in paying judgments from the contractor's bond or security.

(1) If a contractor is secured, the department shall satisfy final judgments against the contractor in the order the department receives the judgments.

(2) If a contractor is bonded, claims for unpaid wages and benefits are satisfied first, claims for damages are satisfied second, and claims for costs and attorney's fees are satisfied last. No claim in a lesser category may be satisfied until all pending claims in the preceding categories are satisfied, unless the total amount of all pending claims in the preceding categories is less than the amount of the bond that remains unimpaired.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-220, filed 12/11/85.]

**WAC 296-310-230 Civil penalties.** (1) In determining the amount of any civil penalty to be imposed under RCW 19.30.160 the department shall consider the following factors:

- (a) Previous violations by the violator;
- (b) The history of the violator in taking all necessary measures to prevent or correct violations;
- (c) The magnitude and seriousness of the violation;
- (d) The remedial purpose of chapter 19.30 RCW;
- (e) Any mitigating circumstances; and
- (f) Any other factors the department considers relevant.

(2) It is the violator's responsibility to inform the department of mitigating evidence.

(3) The penalties for acting as a contractor without a license, or for transporting employees without an endorsement to do so, are:

- (a) Up to \$500 for the first violation;
- (b) Up to \$750 for the second violation; and

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(c) Up to \$1000 for the third and any further violations.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-230, filed 12/11/85.]

**WAC 296-310-240 Adjustment of controversies.** (1) Upon receipt of a complaint or on its own motion, the department shall attempt to adjust equitably a controversy between a contractor and its employees.

(2) No particular form of proceeding is necessary for resolving disputes. The supervisor of employment standards shall, in each case, use his or her best judgment in designing a procedure. However, in every case in which the supervisor determines that a hearing should be held, the supervisor shall notify the affected persons, or their representatives, of the time, date, place, and purpose of the hearing.

(3) A hearing shall be informal and shall not be subject to chapter 34.04 RCW. The supervisor's suggestions for resolution are advisory and not binding, and may not be appealed to any person or court.

(4) The director may delegate the resolution of any particular case to a person other than the supervisor of employment standards. That person shall have the same authority as the supervisor to determine the form of the proceeding.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-240, filed 12/11/85.]

**WAC 296-310-250 Filing and service.** All papers required to be filed with the director under this chapter or chapter 19.30 RCW shall be addressed to Director, Department of Labor and Industries, General Administration Building, Olympia, WA 98504.

Filing and service may be made as provided in WAC 1-08-090 through 1-08-140.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-250, filed 12/11/85.]

**WAC 296-310-260 Liability of person who uses services of unlicensed contractor.** (1) A person who knowingly uses the services of an unlicensed contractor is liable for unpaid wages, damages, and civil and criminal penalties to the same extent as the unlicensed contractor.

(2) Pursuant to RCW 19.30.200, a person may prove lack of knowledge by proving that she or he relied on a license issued by the department under chapter 19.30 RCW, or upon the department's representation that the contractor was licensed. The department shall not make oral representations that a contractor is or is not licensed. All representations by the department that a contractor is licensed shall be made in writing and shall be signed by the director or the employment standards supervisor or the assistant director. The department shall not accept reliance on a supposed oral representation as proof in any administrative enforcement proceeding.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-260, filed 12/11/85.]

**WAC 296-310-270 Inspection of records.** A contractor or any person using a contractor's services shall allow a representative of the department to inspect at any reasonable time the records it is required to keep by chapter 19.30 RCW.

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[Statutory Authority: RCW 19.30.130, 86-01-027 (Order 85-34), § 296-310-270, filed 12/11/85.]

**Chapter 296-350 WAC**  
**WISHA ADMINISTRATIVE RULES**

**WAC**

VARIANCES FROM WISHA RULES

296-350-70025 Interim orders—Description and requesting.

**DISPOSITION OF SECTIONS FORMERLY  
CODIFIED IN THIS CHAPTER**

296-350-010 Definitions. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-010, filed 5/17/00, effective 8/1/00. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-010, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-010, filed 11/13/80; Order 75-14, § 296-350-010, filed 4/14/75; Order 74-21, § 296-350-010, filed 5/6/74.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.

296-350-020 Reassumption of jurisdiction—Purpose. [Order 75-14, § 296-350-020, filed 4/14/75; Order 74-21, § 296-350-020, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

296-350-030 Notice of appeal—Filing and service. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-030, filed 7/20/94, effective 9/20/94; 90-09-026 (Order 90-01), § 296-350-030, filed 4/10/90, effective 5/25/90. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-030, filed 11/13/80; Order 75-14, § 296-350-030, filed 4/14/75; Order 74-21, § 296-350-030, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

296-350-040 Notice of appeal—Contents. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-040, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-040, filed 4/14/75; Order 74-21, § 296-350-040, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

296-350-050 Reassumption of jurisdiction—Time—Notice of reassumption of jurisdiction and informal conference. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-050, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-008 (Order 86-27), § 296-350-050, filed 7/25/86; Order 76-6, § 296-350-050, filed 3/1/76; Order 75-14, § 296-350-350 (codified as WAC 296-350-050), filed 4/14/75; Order 74-21, § 296-350-050, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

296-350-060 Notices of reassumption of jurisdiction and informal conferences—Service—Posting record. [Order 75-14, § 296-350-060, filed 4/14/75; Order 74-21, § 296-350-060, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

296-350-070 Reassumption of jurisdiction—Informal conferences—Procedure—Evidence. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-070, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-070, filed 4/14/75; Order 74-21, § 296-350-070, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

296-350-080 Reassumption of jurisdiction—Final determination—Mailing. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-008 (Order 86-27), § 296-350-080, filed 7/25/86; 82-13-045 (Order 82-22), § 296-350-080,

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296-350-15010

296-350-15015

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296-350-15025

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filed 6/11/82; Order 76-6, § 296-350-080, filed 3/1/76; Order 75-14, § 296-350-080, filed 4/14/75; Order 74-21, § 296-350-080, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Reassumption of jurisdiction—Statement of redetermination—Appeal. [Order 75-14, § 296-350-090, filed 4/14/75; Order 74-21, § 296-350-090, filed 5/6/74.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Settlement agreements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-350-095, filed 6/11/82.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Inspections and citations. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-100, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Selecting workplaces to inspect. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-10010, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Inspections—Site visit. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-10020, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Complaints by employees or employee representatives. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-10030, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Results of a WISHA inspection—Notice of violations. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-10040, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Posting a citation and notice. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-10050, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Civil penalties. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-150, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Assessing civil penalties—Purpose. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15010, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Minimum penalty amounts. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15015, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Severity and probability determine base penalties. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15020, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Severity. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15025, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.

Probability. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15030, filed 5/17/00, effective 8/1/00.] Repealed by 01-

	11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-300	Repeat violations. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-06-002 (Order 86-17), § 296-350-300, filed 2/20/86.] Repealed by 91-24-017 (Order 91-07), filed 11/22/91, effective 12/24/91. Statutory Authority: Chapter 49.17 RCW.
296-350-15035	Gravity and base penalties. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15035, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-350	Extension of abatement date(s)—Application—Authority. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-350, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-350, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].-040, and [49.17].050.
296-350-15040	Adjustments to base penalties. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15040, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35010	Application for extension of abatement date(s). [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-35010, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35010, filed 11/13/80; Order 76-29, § 296-350-35010, filed 9/30/76; Order 75-14, § 296-350-35010, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-15045	Increasing penalty amounts. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-15045, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35015	Extension of abatement date(s)—Application—Timeliness. [Order 76-29, § 296-350-35015, filed 9/30/76; Order 75-14, § 296-350-35015, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-200	Variations—Foreword. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-200, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-200, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35020	Extension of abatement date(s)—Application—Service. [Order 75-14, § 296-350-35020, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-210	Types of orders granting a variance. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-210, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-210, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35025	Extension of abatement date(s)—Application—Contents. [Order 75-14, § 296-350-35025, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-230	Effect of variances. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-230, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-230, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35030	Extension of abatement date(s)—Provisional determination. [Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35030, filed 11/13/80; Order 75-14, § 296-350-35030, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-240	Variance applications—Form of documents—Subscription. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-240, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-240, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35035	Extension of abatement date(s)—Notice of application—Notice of opportunity for hearing—Notice of provisional determination. [Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35035, filed 11/13/80; Order 75-14, § 296-350-35035, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-250	Order granting a temporary variance—Application. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-250, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-250, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35040	Extension of abatement date(s)—Posting. [Order 75-14, § 296-350-35040, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-255	Order granting a permanent variance—Application. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-255, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-255, filed 11/13/80; Order 75-14, § 296-350-255, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35045	Extension of abatement date(s)—Application for hearing. [Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35045, filed 11/13/80; Order 75-14, § 296-350-35045, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-260	Interim order—Application—Notice of grant. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-260, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-260, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35050	Extension of abatement date(s)—Notice of hearing. [Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35050, filed 11/13/80; Order 75-14, § 296-350-35050, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-270	Notice of denial of application for variance. [Order 75-14, § 296-350-270, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-35055	Extension of abatement date(s)—Hearings. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-35055, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-350-35055, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35055, filed
296-350-280	Hearings on applications for variances—Temporary and permanent. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-280, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-280, filed 11/13/80; Order 75-14, § 296-350-280, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.		

	11/13/80; Order 75-14, § 296-350-35055, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17]-040, and [49.17].050.		Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-35060	Extension of abatement date(s)—Decision and order. [Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35060, filed 11/13/80; Order 75-14, § 296-350-35060, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17]-050.	296-350-60025	Reassuming jurisdiction or forwarding an appeal to the board. [Statutory Authority: RCW 49.17.010, [49.17]-040, and [49.17].050. 00-11-098, § 296-350-60025, filed 5/17/00, effective 8/1/00.] Repealed by 01-17-033, filed 8/8/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-400	Posting of notices—Posting of citation and notice—Availability of act and applicable standards. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-400, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-350-400, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-350-400, filed 1/17/86; 82-13-045 (Order 82-22), § 296-350-400, filed 6/11/82; Order 75-14, § 296-350-400, filed 4/14/75. Formerly WAC 296-27-200.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-60030	Reviewing appeals and extending review time. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-60030, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-450	Complaints by employees or their representatives. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-450, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-450, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-60035	Informal WISHA conferences. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-60035, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-460	Complaints—Inspection not warranted—Informal review. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-460, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-460, filed 11/13/80; Order 75-41, § 296-350-460, filed 12/19/75; Order 75-14, § 296-350-460, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-60040	Issuing and appealing corrective notices. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-60040, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-470	Citation not issued following complaint. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-470, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-470, filed 11/13/80; Order 75-14, § 296-350-470, filed 4/14/75.] Repealed by 00-11-098, filed 5/17/00, effective 8/1/00. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-60045	Notifying employees. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-60045, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.
296-350-500	Citation and notice—Copy to employee representative. [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-500, filed 7/20/94, effective 9/20/94; 87-24-051 (Order 87-24), § 296-350-500, filed 11/30/87. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-500, filed 11/13/80; Order 75-14, § 296-350-500, filed 4/14/75.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-700	Variance from WISHA rules. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-700, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
296-350-600	WISHA appeals. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-600, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17]-050.	296-350-70010	Purpose of variances. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70010, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
296-350-60010	Filing an appeal—Who, when and where. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17]-050. 00-11-098, § 296-350-60010, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-70015	Permanent variances—Description. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70015, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
296-350-60015	What must be in a WISHA appeal. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-60015, filed 5/17/00, effective 8/1/00.] Repealed by 01-11-038, filed 5/9/01, effective 9/1/01. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-350-70020	Temporary variances—Description. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70020, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
296-350-60020	Why we reassume jurisdiction. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-60020, filed 5/17/00, effective 8/1/00.]	296-350-70030	Requesting a permanent variance. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70030, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
		296-350-70035	Requesting a temporary variance. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70035, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
		296-350-70040	Renewing temporary variances. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70040, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
		296-350-70045	Submitting variance requests. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-

098, § 296-350-70045, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.

- 296-350-70050 Notifying employees about variance requests. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].-050. 00-11-098, § 296-350-70050, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
- 296-350-70055 Department review and decision. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70055, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
- 296-350-70060 Your responsibilities once we make a decision. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70060, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
- 296-350-70065 Changing a variance. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70065, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
- 296-350-70070 Variance hearings. [Statutory Authority: RCW 49.17.-010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70070, filed 5/17/00, effective 8/1/00.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.
- 296-350-990 Appendix A—Form F418-023-000—Application for copies of citations and notices. [Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-350-990, filed 11/30/87. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-990, filed 11/13/80; Order 75-14, Appendix A—Form 300 (codified as WAC 296-350-990), filed 4/14/75.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 WAC.

## VARIANCES FROM WISHA RULES

**WAC 296-350-70025 Interim orders—Description and requesting.** (1) You may request an interim order when requesting a permanent or temporary variance, or anytime after. Interim orders allow you to vary from existing WISHA requirements until we make a final decision on your variance request.

(2) We may choose to issue an interim order in response to a variance request, even when the interim order was not specifically requested.

(3) Our decision to grant or deny an interim order will not restrict our decision on a permanent or temporary variance request.

(4) Interim orders will be effective until revoked or until we approve or deny your variance request.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 00-11-098, § 296-350-70025, filed 5/17/00, effective 8/1/00.]

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## Chapter 296-360 WAC

### DISCRIMINATION, PURSUANT TO RCW 49.17.160

#### WAC

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296-360-160 Payment of damages to employee discriminated against.  
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**WAC 296-360-005 Definitions.** For the purposes of this chapter.

(1) "Assistant director" - the assistant director for the division of consultation and compliance.

(2) "Division" - the division of consultation and compliance of the department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-005, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-005, filed 11/13/80.]

**WAC 296-360-010 Introduction.** (1) Chapter 49.17 RCW, the Washington Industrial Safety and Health Act (WISHA), is designed to regulate employment conditions affecting industrial safety and health and to achieve safer and healthier work places throughout the state. WISHA requires every person who has employees to furnish each of his or her employees employment and a place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm, and to comply with industrial safety and health standards promulgated under WISHA.

(2) Employees and representatives of employees are afforded a wide range of substantive and procedural rights under WISHA. Effective implementation of WISHA and achievement of its goals depend in large part upon the active but orderly participation of employees, individually and through their representatives.

(3) This chapter deals essentially with the rights of employees afforded under RCW 49.17.160. RCW 49.17.160 prohibits reprisals, in any form, against employees who exercise rights under WISHA. The purpose of this chapter is to make available in one place interpretations of the various provisions of section 16 of WISHA that will guide the assistant director in the performance of his or her duties thereunder.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-010, filed 11/13/80.]

**WAC 296-360-020 General requirements of RCW 49.17.160 of WISHA.** RCW 49.17.160 provides that no per-

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son shall discharge or in any manner discriminate against any employee because the employee has filed any complaint under or related to WISHA, instituted or caused to be instituted any proceeding under or related to WISHA, testified or is about to testify in any proceeding under or related to WISHA, or exercised on his or her own behalf or on behalf of others any right afforded by WISHA. Any employee who believes that he/she has been discriminated against in violation of section 16 of WISHA may, within thirty days after the violation occurs, file a complaint with the assistant director alleging the violation. The division shall investigate the complaint and, if the assistant director determines that section 16 of WISHA has been violated, the division may bring a civil action against the violator in superior court. The suit may ask the court to restrain violations of RCW 49.17.160 and to grant other appropriate relief, including rehiring or reinstating the employee to his or her former position with back pay.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-020, filed 11/13/80.]

**WAC 296-360-030 Filing a complaint of discrimination.** (1) Who may file. A complaint of RCW 49.17.160 discrimination may be filed by the employee him- or herself, or by a representative authorized to do so on his or her behalf.

(2) Nature of filing. No particular form of complaint is required.

(3) Place of filing. The complaint should be filed with the division.

(4) Time for filing. RCW 49.17.160(3) provides that an employee who believes that he or she has been discriminated against in violation of RCW 49.17.160 "may, within thirty days after such violation occurs" file a complaint with the assistant director. A major purpose of the thirty-day period is to allow the assistant director to decline to entertain complaints that have become stale. Accordingly, the division will presume that complaints not filed within thirty days of an alleged violation are untimely. There may be circumstances, however, that justify tolling the thirty-day period on recognized equitable principles or because strongly extenuating circumstances exist, e.g., where the employer has concealed, or misled the employee regarding the grounds for, discharge or other adverse action. In the absence of circumstances justifying a tolling of the thirty-day period, the division shall not accept untimely complaints.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-360-030, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-030, filed 11/13/80.]

**WAC 296-360-040 Notification of assistant director's determination.** (1) RCW 49.17.160(3) provides that the assistant director is to notify a complainant within ninety days of the complaint of his determination whether prohibited discrimination has occurred. This ninety-day provision is directory, not mandatory. Although every effort will be made to notify complainants of the assistant director's determination within ninety days, there may be instances when it is not possible to do so.

(2) If a complainant receives a determination from the assistant director that prohibited discrimination has not occurred, the complainant may file a written request for

review by the director within fifteen working days of receipt of the determination. The request for review must set forth the basis for the request. The request shall be filed by mailing or delivering the request to the Director of Labor and Industries, P.O. Box 44000, Olympia, Washington 98504-4000. Upon review the director may set aside the assistant director's determination, remand the matter for further investigation, or affirm the determination of the assistant director. The director shall notify the complainant of the decision after review.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-040, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-360-040, filed 4/19/85. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-040, filed 11/13/80.]

**WAC 296-360-050 Withdrawal of complaint.** Enforcing the provisions of RCW 49.17.160 is not only a matter of protecting rights of individual employees, but also of protecting the public interest. Attempts by an employee to withdraw a filed complaint will not necessarily result in termination of the division's investigation. The division's jurisdiction cannot be foreclosed as a matter of law by unilateral action of the employee. However, a voluntary and uncoerced request from a complainant to withdraw his/her complaint shall generally be accepted.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-050, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-050, filed 11/13/80.]

**WAC 296-360-060 Arbitration or other agency proceedings.** (1) General.

(a) An employee who files a complaint under RCW 49.17.160 may pursue remedies under grievance arbitration proceedings in collective bargaining agreements, and may also resort to other agencies, such as the National Labor Relations Board, for relief. The division's jurisdiction to entertain RCW 49.17.160 complaints, to investigate, and to determine whether discrimination has occurred, is independent of the jurisdiction of other agencies or bodies. The division may file an action in superior court regardless of the pendency of other proceedings.

(b) Where it is possible, however, the division favors voluntary resolution of disputes under procedures in collective bargaining agreements. Also, the division should defer to the jurisdiction of other forums established to resolve disputes that may also be related to RCW 49.17.160 complaints. Thus, where a complainant is pursuing remedies other than those provided by RCW 49.17.160 it may be proper to postpone the assistant director's determination whether discrimination has occurred, and defer to the results of such proceedings.

(2) Postponement of determination. Postponement of determination is justified where the rights asserted in other proceedings are substantially the same as rights under RCW 49.17.160 and those proceedings are not likely to violate the rights guaranteed by RCW 49.17.160. The factual issues in the such proceedings must be substantially the same as those raised by the RCW 49.17.160 complaint, and the forum hearing the matter must have the power to determine the ultimate issue of discrimination.

(3) Deferral to outcome of other proceedings. Determinations to defer to the outcome of another proceeding begun by a complainant must be made after careful scrutiny. It must be clear that the proceeding dealt adequately with all factual issues, that it was fair, regular, and free of procedural infirmities, and that its outcome did not violate the purpose and policy of WISHA. If another action begun by a complainant is dismissed without an adjudicatory hearing on the merits, the division will not necessarily regard the dismissal as determinative of the merits of the RCW 49.17.160 complaint.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-060, filed 11/13/80.]

**WAC 296-360-070 Persons prohibited from discriminating.** RCW 49.17.160 specifically states that "no person shall discharge or in any manner discriminate against any employee" because the employee has exercised rights under WISHA. RCW 49.17.020(5), defines "person" as "one or more individuals, partnerships, associations, corporations, business trusts, legal representatives, or any organized group of persons." Consequently, the prohibitions of RCW 49.17.160 are not limited to actions taken by employers against their own employees. A person may be charged with discriminating against an employee of another person. RCW 49.17.160 extends to such entities as organizations representing employees in collective bargaining, employment agencies, or any other person in a position to discriminate against an employee. See *Meek v. United States*, 136 F.2d 679 (6th Cir., 1943); *Bowe v. Judson C. Burns*, 137 F.2d 37 (3rd Cir., 1943).

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-070, filed 11/13/80.]

**WAC 296-360-080 Persons protected by RCW 49.17.160.** (1) All employees are afforded the full protection of RCW 49.17.160. WISHA defines an employee as "an employee of an employer who is employed in a business of his/her employer which affects commerce." RCW 49.17.020 (4). WISHA does not define "employ"; however, the broad remedial nature of WISHA demonstrates a clear intent that the existence of an employment relationship, for purposes of RCW 49.17.160, is to be based upon economic realities rather than upon common law doctrines and concepts. See *U.S. v. Silk*, 331 U.S. 704 (1947); *Rutherford Food Corporation v. McComb*, 331 U.S. 722 (1947).

(2) For purposes of RCW 49.17.160, an applicant for employment could be considered an employee. See *NLRB v. Lamar Creamery*, 246 F.2d 8 (5th Cir., 1957).

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-080, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-080, filed 11/13/80.]

**WAC 296-360-090 Unprotected activities distinguished.** (1) An employer or others may base actions that adversely affect an employee upon nondiscriminatory grounds. An employee's engagement in activities protected by WISHA does not automatically render him/her immune from discharge or discipline for legitimate reasons, or from adverse action dictated by nonprohibited considerations. See

*NLRB v. Dixie Motor Coach Corp.* 128 F.2d 201 (5th Cir., 1942).

(2) To establish a violation of RCW 49.17.160, the employee's engagement in protected activity need not be the sole consideration behind discharge or other adverse action. If protected activity was a substantial reason for the action, or if the discharge or other adverse action would not have taken place "but for" the employee's engagement in protected activity, RCW 49.17.160 has been violated.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-090, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-090, filed 11/13/80.]

**WAC 296-360-100 Discrimination because of a complaint under or related to WISHA.** RCW 49.17.160 prohibits discharge of, or discrimination against, an employee because the employee has filed any complaint under or related to this act.

(1) An example of a complaint made "under" WISHA would be an employee request for inspection pursuant to section 11 (RCW 49.17.110). This is not the only type of complaint protected by RCW 49.17.160, however. The range of complaints "related to" WISHA is commensurate with the broad remedial purposes of this legislation and the sweeping scope of its application.

(2) Complaints registered with other state or federal agencies that have the authority to regulate or investigate industrial safety and health conditions are complaints "related to" WISHA.

(3) The protection offered employees by WISHA would be seriously undermined if employees were discouraged from lodging complaints about industrial safety and health matters with their employers. Complaints to employers, if made in good faith, are related to WISHA, and an employee is protected against discharge or discrimination caused by a complaint to the employer.

(4) To come within the protection of RCW 49.17.160, a complaint must relate to conditions at the work place, as distinguished from complaints touching only upon general public safety and health.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-100, filed 11/13/80.]

**WAC 296-360-110 Discrimination because of a proceeding under or related to the act.** (1) RCW 49.17.160 prohibits discharge of, or discrimination against, any employee because the employee has "instituted or caused to be instituted any proceeding under or related to WISHA." Proceedings that can arise specifically under WISHA include inspections of worksites under RCW 49.17.070, employee contest of an abatement date under RCW 49.17.140, employee initiation of proceedings for promulgation of an industrial safety and health standard, employee application for modification or revocation of a variance under RCW 49.17.080, employee judicial challenge of a standard, and employee appeal of board of industrial insurance appeals order under RCW 49.17.140. In determining whether a "proceeding" is "related to" WISHA, the considerations discussed in WAC 296-360-100 are also applicable.

(2) An employee need not directly institute a proceeding. It is sufficient if he or she sets into motion acts of others that result in proceedings under or related to WISHA.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-110, filed 11/13/80.]

**WAC 296-360-120 Discrimination because of testimony.** RCW 49.17.160 prohibits discharge of, or discrimination against, any employee because the employee "has testified or is about to testify" in proceedings under or related to WISHA. This protection is not limited to testimony in proceedings instituted or caused to be instituted by the employee, but extends to any statements given in the course of judicial, quasijudicial, and administrative proceedings, including inspections, investigations, administrative adjudications, and rules hearings.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-120, filed 11/13/80.]

**WAC 296-360-130 Discrimination because of exercise of any right afforded by WISHA—In general.** In addition to protecting employees who file complaints, institute proceedings, or testify in proceedings under or related to WISHA, RCW 49.17.160 also protects employees from discrimination occurring because of the exercise "of any right afforded by this chapter." Certain rights are explicitly stated in WISHA. Other rights exist by necessary implication. For example, employees may request information from the occupational safety and health administration or the department of labor and industries. Also, employees interviewed by agents of the division in the course of inspections or investigations cannot subsequently be discriminated against because of their cooperation.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-130, filed 11/13/80.]

**WAC 296-360-140 Discrimination because of exercise of right afforded by WISHA—Walkaround pay.** Employee participation in walkaround inspections under RCW 49.17.100 is essential. Employees are a vital source of information to the division about work place hazards. Employees must be able freely to exercise their statutory right to participate in walkarounds without fear of economic loss, such as the denial of pay for the time spent helping WISHA inspectors during the walkaround. To ensure the unimpeded flow of information to the inspectors, and the unfettered statutory right of employees to participate in walkaround inspections, an employer's failure to pay employees for time they spend in walkaround inspections is discrimination under RCW 49.17.160. In addition, an employer's failure to pay employees for time spent in other inspection-related activities, such as answering questions of inspectors or participating in the opening and closing conferences, is discrimination under RCW 49.17.160.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-140, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-140, filed 11/13/80.]

**WAC 296-360-150 Discrimination because of exercise of right afforded by WISHA—Refusal to work in an**

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**unsafe condition.** (1) Review of WISHA and examination of the legislative history discloses that, as a general matter, WISHA grants no specific right to employees to walk off the job because of potential unsafe conditions at the work place. A hazardous condition that may violate WISHA will ordinarily be corrected by the employer, once brought to its attention. If the employer does not correct a hazard, or if there is a dispute about the existence of a hazard, the employee normally can ask the division to inspect the work place pursuant to RCW 49.17.110, or can seek help from other public agencies that have responsibility for safety and health. Under such circumstances, an employer would not violate RCW 49.17.160 by disciplining an employee who refuses to work because of an alleged safety or health hazard.

(2) Occasions arise, however, when an employee is confronted with a choice between not performing assigned tasks or subjecting him- or herself to serious injury or death arising from a hazard at the work place. If the employee, with no reasonable alternative, refuses in good faith to expose him- or herself to the dangerous condition, he or she is protected against subsequent discrimination.

(3) An employee's refusal to work is protected if he or she meets the following requirements:

(a) The refusal to work must be in good faith, and must not be a disguised attempt to harass the employer or disrupt the employer's business;

(b) The hazard causing the employee's apprehension of death or injury must be such that a reasonable person, under the circumstances then confronting the employee, would conclude that there is a real danger of death or serious injury; and

(c) There must be insufficient time, due to the urgency of the situation, to eliminate the danger through resort to regular statutory enforcement channels.

(4) As indicated in subsection (3), an employee's refusal to work is not protected unless it is a good faith response to a hazardous condition. To determine whether an employee has acted in good faith, the division will consider, among other factors, whether the employee:

(a) Asked the employer to correct the hazard;

(b) Asked for other work;

(c) Remained on the job until ordered to leave by the employer; or

(d) Informed the employer that, if the hazard was not corrected, the employee would refuse to work.

The lack of one or more of these factors shall not necessarily preclude a finding of good faith if other factors do establish good faith. The division will also consider whether the employer knew that the hazard could cause serious injury or death, or that the hazard was prescribed by a specific safety standard promulgated under WISHA or any other law that relates to the safety and health of a place of employment.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-150, filed 11/13/80.]

**WAC 296-360-160 Payment of damages to employee discriminated against.** (1) If an employer discriminates against an employee such that the employee earns less than he or she would have earned absent the discrimination, the employer shall pay the employee the difference between the wages that the employee would have earned absent the dis-

crimination and the wages the employee actually earned after the discrimination.

(2) If an employer discriminates against an employee for a refusal to work that is protected under WAC 296-360-150, the employer need not pay the employee's wages for the time spent fixing the hazard, or that would have been spent fixing the hazard, if the employer (a) had to or would have had to shut down the job to make the repair and (b) had not other work the employee could have done.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-160, filed 11/13/80.]

**WAC 296-360-170 Employee's refusal to comply with safety rules.** An employee who refuses to comply with industrial safety and health standards or valid safety rules implemented by the employer in furtherance of WISHA is not exercising a right afforded by WISHA. Discipline taken by employers solely in response to an employee's refusal to comply with appropriate safety rules and regulations is not discrimination prohibited by RCW 49.17.160. This situation should be distinguished from refusals to work discussed in WAC 296-360-150.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-170, filed 11/13/80.]

## Chapter 296-400A WAC

### PLUMBER CERTIFICATION RULES

(Formerly chapter 296-400 WAC)

#### WAC

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**WAC 296-400A-005 What definitions do I need to know to understand these rules?** Unless a different meaning is clearly required by the context, the following terms and definitions are important:

**"Advisory board"** is the state advisory board of plumbers.

**"Audit"** means an assessment, evaluation, examination or investigation of, contractor's accounts, books and records for the purpose of verifying the contractor's compliance with RCW 18.106.320.

**"Backflow assembly"** or **"backflow prevention assembly"** or **"backflow preventer"** is a device as described in the Uniform Plumbing Code used to prevent the undesired reversal of flow of water or other substances through a cross-connection into the public water system or consumer's potable water system.

**"Backflow assembly tester"** is an individual certified by the department of health to perform tests to backflow assemblies.

**"Continuing education"** is approved plumbing and electrical courses for journeyman, domestic pump specialty plumber, and residential specialty plumbers, to meet the requirements to maintain their plumbing certification and for trainees or individuals to become certified plumbers in Washington.

**"Continuing education course provider"** is an entity approved by the department, in consultation with the state advisory board of plumbers, to provide continuing education training for journeyman, domestic pump specialty plumbers, residential specialty plumbers, and trainees. All training course providers must comply with the requirements in WAC 296-400A-028.

**"Continuity affidavit"** is a form developed by the department that is used to verify whether medical gas pipe installation work (brazing process) has been performed biannually. This form is provided to the department annually by the person holding the medical gas piping installer endorsement and requires the signature of the employer of the medical gas piping installer or another qualified verifier as determined by the department. Continuity is a visual examination by the employer of the brazing that was performed.

**"Contractor"** means any person, corporate or otherwise, who engages in, or offers or advertises to engage in, any work covered by the provisions of chapter 18.106 RCW by way of trade or business, or any person, corporate or otherwise, who employs anyone, or offers or advertises to employ anyone, to engage in any work covered by the provisions of chapter 18.106 RCW and is registered as a contractor under chapter 18.27 RCW.

**"Dispatcher"** means the contractor's employee who authorized the work assignment of the person employed in violation of chapter 18.106 RCW.

**"Department"** is the department of labor and industries.

**"Director"** is the director of the department of labor and industries.

**"Journeyman plumber"** is anyone who has learned the commercial plumbing trade and has been issued a journeyman certificate of competency by the department. A journeyman plumber may work on plumbing projects including residential, commercial and industrial worksite locations.

**"Medical gas piping installer"** is anyone who has been issued a medical gas piping installer endorsement of competency by the department.

**"Medical gas piping systems"** are piping systems that convey or involve oxygen, nitrous oxide, high pressure nitrogen, medical compressed air, or medical vacuum systems.

**"Plumbing"** is that craft involved in installing, altering, repairing and renovating potable water systems, liquid waste systems and medical gas piping systems within a building. The installation of water softening or water treatment equipment into a water system is not considered plumbing.

**"Records"** include, but are not limited to, all bids, invoices, billing receipts, time cards and payroll records that show the work was performed, advertised, or bid.

**"Specialty plumber"** is anyone who has been issued a specialty plumbers certificate of competency by the department limited to:

(a) Installation, maintenance and repair of plumbing for single-family dwellings, duplexes and apartment buildings which do not exceed three stories; or

(b) Maintenance and repair of backflow assemblies located within a residential or commercial building or structure. For the purposes of this subsection, "maintenance and repair" includes cleaning and replacing internal parts of an assembly, but does not include installing or replacing backflow assemblies.

(c) "Domestic pump specialty" means the installation, maintenance, and repair of a domestic water pumping system consisting of the pressurization, treatment, and filtration components of a domestic water system consisting of: One or more pumps; pressure, storage, and other tanks; filtration and treatment equipment; if appropriate, a pitless adapter; along with valves, transducers, and other plumbing components that:

(i) Are used to acquire, treat, store, or move water suitable for either drinking or other domestic purposes, including irrigation, to:

(A) A single-family dwelling, duplex, or other similar place of residence;

(B) A public water system, as defined in RCW 70.119.-020 and as limited under RCW 70.119.040; or

(C) A farm owned and operated by a person whose primary residence is located within thirty miles of any part of the farm;

(ii) Are located within the interior space, including but not limited to an attic, basement, crawl space, or garage, of a residential structure, which space is separated from the living area of the residence by a lockable entrance and fixed walls, ceiling, or floor;

(iii) If located within the interior space of a residential structure, are connected to a plumbing distribution system supplied and installed into the interior space by either:

(A) A person who, pursuant to RCW 18.106.070 or 18.106.090, possesses a valid temporary permit or certificate of competency as a journeyman plumber, specialty plumber, or trainee, as defined in this chapter; or

(B) A person exempt from the requirement to obtain a certified plumber to do such plumbing work under RCW 18.106.150.

For the purposes of the domestic pump specialty, residential structure includes any improvement to real property where that property is primarily used as a residence.

**"Supervision"** for the purpose of these rules means within sight or sound. Supervision requirements are met when the supervising plumber is on the premises and within sight or sound of the individual who is being trained.

**"Training course provider"** is an entity approved by the department, in consultation with the state advisory board of plumbers, to provide medical gas piping installer training. All training course providers must comply with the requirements in WAC 296-400A-026.

**"Trainee plumber"** is anyone who has been issued a trainee certificate and is learning or being trained in the plumbing trade with direct supervision of either a journeyman plumber or specialty plumber working in their specialty.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-005, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 19.103.040, 18.106.140, and chapter 18.106 RCW. 05-11-061, § 296-400A-005, filed 5/17/05, effective 6/30/05. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-005, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-005, filed 6/28/02, effective 7/1/02. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-005, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-005, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-010 Plumbing certificate types and scope of work.** (1) **Journeyman plumber (PL01):** A journeyman plumber may work on all phases of plumbing projects including residential, commercial and industrial worksite locations. A plumber trainee must have a training certificate in order to perform plumbing work under the supervision of a certified journeyman plumber.

(2) **Residential specialty plumber (PL02):** Installation, maintenance and repair of all phases of plumbing for single-family dwellings, duplexes and apartment buildings which do not exceed three stories. A plumber trainee must have a training certificate in order to perform plumbing work as a residential specialty plumber under the supervision of a certified residential or journeyman plumber.

(3) **Backflow specialty plumber (PL30):** Maintenance and repair of backflow assemblies located within a residential

or commercial building or structure. For the purposes of this subsection, "maintenance and repair" includes cleaning and replacing internal parts of an assembly, but does not include installing or replacing backflow assemblies. A plumber trainee must have a PT31 certificate in order to do work as a backflow specialty plumber under the supervision of a certified backflow specialty plumber, certified residential specialty plumber or certified journeyman plumber. PT31 trainee requires one hundred percent supervision.

**(4) Pump and irrigation specialty plumber (PL03):** Installation, maintenance and repair of equipment that is used to acquire, treat, store, or move water suitable for either drinking or other domestic purposes, including irrigation or to a domestic water pumping system consisting of the pressurization, treatment, and filtration components of a domestic water system consisting of: One or more pumps; pressure, storage, and other tanks; filtration and treatment equipment. For the purposes of this subsection, if located within the interior space of a residential structure as stated in RCW 18.106.010 (10)(c), only the equipment and piping defined by RCW 18.106.010 (10)(c) are included in this specialty and other parts of the system must be worked on by the appropriate certification.

**(5) Limited volume domestic pump specialty plumber (PL03A):** Installation, maintenance and repair of equipment that is used to acquire, treat, store, or move water suitable for either drinking or other domestic purposes on pumping systems not exceeding one hundred gallons per minute. A domestic water pumping system consisting of the pressurization, treatment, and filtration components of a domestic water system consisting of: One or more pumps; pressure, storage, and other tanks; filtration and treatment equipment. For the purposes of this subsection, if located within the interior space of a residential structure as stated in RCW 18.106.010 (10)(c), only the equipment and piping to stated equipment in this locked room can be worked on by this certification; other parts of the system must be worked on by the appropriate certification.

**(6) Plumber trainee (PT00, PT03, PT03A, and PT31):** Is an individual learning the trade or craft of plumbing. Trainees are required to have and maintain a valid plumber's training certificate. Trainees will be accredited for those hours worked within the scope of their supervising plumber. Any plumber trainee may perform plumbing work within the scope of their supervising journeyman or specialty plumber. A trainee shall keep a record of the hours worked as a trainee as required by WAC 296-400A-120(3).

**(7) Certified journeyman electricians, certified residential specialty electricians, or electrical trainees (EL01 and EL02):** According to RCW 18.106.150 (2)(b), a current plumbing certificate of competency or apprentice permit is not required for: Certified journeyman electricians, certified residential specialty electricians, or electrical trainees working for an electrical contractor and performing exempt work under RCW 18.27.090(18). A plumber trainee must have a ET00 certificate in order to work with a journeyman electrician, residential specialty electrician, or electrical trainee.

The plumbing work must be directly and immediately appropriate to the like-in-kind replacement of a household fixture or its component(s) that requires limited power and waste/water connections.

An example would be replacing the heating element (a component) of an electric hot water heater. An electrician performing a like-in-kind replacement of an electric hot water tank could only disconnect and then reconnect the water supply lines to the tank and drain line from the temperature and pressure relief valve. Gas hot water tanks are not part of the electrician's exemption.

[Statutory Authority: RCW 18.106.040, 18.106.140. 06-24-040, § 296-400A-010, filed 11/30/06, effective 12/31/06.]

**WAC 296-400A-020 How do I obtain a certificate of competency?** You can obtain a certificate of competency by completing the following requirements for:

(1) Journeyman and specialty plumber certificate (excluding backflow assembly maintenance and repair specialty certification):

(a) Submitting a competency examination application to the department;

(b) Paying the examination fee shown in WAC 296-400A-045(1);

(c) Submitting the required evidence of competency and experience to the department as required under WAC 296-400A-120 and 296-400A-121;

(d) Passing the competency examination;

(e) Providing documentation to the department with continuing education requirements;

(f) In lieu of (a), (b) and (c) of this subsection and with the approval of the advisory board, the department may accept the successful passage of an examination administered by a nationally recognized testing entity; and

(g) For domestic pump specialty plumbers, in lieu of (a), (b) and (c) of this subsection and with the approval of the advisory board, the department may accept a certification issued by professional trade association.

(2) Backflow assembly maintenance and repair specialty certificate:

(a) Submitting a competency examination application to the department;

(b) Paying the application and certificate fee shown in WAC 296-400A-045(2); and

(c) Passing the competency examination.

[Statutory Authority: RCW 18.106.040, 18.106.140. 06-24-040, § 296-400A-020, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-020, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-020, filed 6/28/02, effective 7/1/02. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-020, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-021 How do I obtain a medical gas piping installer endorsement? (Only journeyman plumbers holding active state of Washington certification may apply for this endorsement.)**

You can obtain a medical gas piping installer endorsement by completing the following requirements:

(1) Submit an application to the department; and

(2) Pay the examination application fee shown in WAC 296-400A-045; and

(3) Submit the required evidence of approved training to the department; and

(4) Pass the written and practical competency examination;\* and

(5) Pay the endorsement issuance fee shown in WAC 296-400A-045 to the department.

\*The written and practical competency examination is performed under contract with a nationally recognized testing agency. The results of the competency examination will be forwarded to the department for processing.

[Statutory Authority: RCW 19.103.040, 18.106.140, and chapter 18.106 RCW. 05-11-061, § 296-400A-021, filed 5/17/05, effective 6/30/05. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-021, filed 5/28/04, effective 6/30/04. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-021, filed 6/17/98, effective 7/20/98.]

**WAC 296-400A-022 What procedure is required for renewal of a journeyman medical gas endorsement?** (1) Maintain an active Washington state journeyman certification;

(2) Submit affidavit of continuity;

(3) Submit affidavit of review of current medical gas code adopted by the Washington state building code council;

(4) Pay the appropriate fee: If renewal occurs before expiration of current endorsement, the renewal fee shown in WAC 296-400A-045; if renewal occurs within ninety days of expiration of current endorsement, you must pay a double renewal fee; if the current endorsement has been expired for ninety-one days or more, you must take an examination relating to medical gas installation administered by the department and pay the examination application fee shown in WAC 296-400A-045; and

(5) Contractors shall accurately verify and attest to brazing performed by the journeyman by sending an affidavit to the department.

[Statutory Authority: RCW 19.103.040, 18.106.140, and chapter 18.106 RCW. 05-11-061, § 296-400A-022, filed 5/17/05, effective 6/30/05.]

**WAC 296-400A-023 What process is required for renewal of journeyman, domestic pump specialty, and residential specialty plumber certificates of competency?**

(1) An individual must apply for renewal of their plumbing certificate before the expiration date of the certificate. The individual may not apply for renewal more than ninety days prior to the expiration date. Journeyman and residential specialty plumber certificates are renewed every two years. Domestic pump specialty plumber certificates are renewed every three years.

(2) An individual may renew their certificate within ninety days after the expiration date without reexamination if the individual pays the late renewal fee listed in WAC 296-400A-045.

(3) All applications for renewal received more than ninety days after the expiration date of the plumbing certificate require that the plumber pass the appropriate competency examination before being recertified.

(4) All applicants for plumbing certificate renewal must:

(a) Submit a complete renewal application;

(b) Pay all appropriate fees; and

(c) Provide accurate evidence on the renewal form that the individual has completed the continuing education requirements described in WAC 296-400A-028.

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If an individual files inaccurate or false evidence of continuing education information when renewing a plumbing certificate, the individual's plumbing certificate may be suspended or revoked.

(5) A journeyman, domestic pump specialty, or residential specialty plumber certificate holder who has not completed the required hours of continuing education prior to the renewal date must pay a doubled fee according to RCW 18.106.070. Also, if the required hours of continuing education are not completed within ninety days after the expiration date the applicant will be required to retake the examination and pay the appropriate fees prior to being placed in active status.

(6) An individual may renew a suspended plumbing certificate by submitting a complete renewal application including obtaining and submitting the continuing education required for renewal. However, the certificate will remain in a suspended status for the duration of the suspension period.

(7) An individual may not renew a revoked plumbing certificate.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-023, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-023, filed 5/28/04, effective 6/30/04.]

**WAC 296-400A-025 Who approves medical gas piping installer endorsement training courses?** RCW 18.106.050 authorizes the department to:

(1) Approve training courses for the medical gas piping installer endorsement; and

(2) Set training course fees.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-025, filed 6/17/98, effective 7/20/98.]

**WAC 296-400A-026 What training course approval procedures for medical gas will the department follow?**

(1) The department will review and approve courses submitted by training course providers that offer medical gas piping systems training. Course approvals will be decided in consultation with the state advisory board of plumbers.

(2) All providers seeking course approval, must submit the required information (see subsection (5) of this section) to the department at least thirty days before a regularly scheduled advisory board meeting. **No course can be offered as meeting the requirements of a medical gas endorsement until it has been approved.**

(3) All material required for approval will be reviewed without testimony and the review will be based solely upon the information submitted. Once reviewed, the department has five working days to give a provider written notification of acceptance or rejection. In the case of rejection, the department must specify its reasons.

(4) If a provider has a course rejected, it may request a hearing before the advisory board at the next regularly scheduled meeting. Any information supporting the provider's position, which was not included with the original approval request, must be submitted to the board at least twenty days before the meeting at which the hearing will be held.

At the hearing, the department and the provider may produce witnesses and give testimony. The hearing must be conducted according to chapter 34.05 RCW. The board must

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base its decision upon the testimony and evidence presented and must notify the parties immediately upon reaching its decision. A majority of the board is necessary to render a decision.

(5) Specific course approval criteria:

(a) All training courses must conform to and be based upon current standards and requirements governing the installation of medical gas piping systems.

(b) All course approval requests must include:

(i) A general description of the course including its scope, the instructional materials to be used and the instructional methods to be followed; and

(ii) A copy of the complete medical gas piping installer training curriculum; and

(iii) A detailed course outline; and

(iv) The name and qualifications of the course instructor(s); and

(v) The locations where the course will be taught; and

(vi) The days and hours the course will be offered; and

(vii) The specific fees associated with the course, as well as, the total cost of the course.

(c) All fees for approved training courses must be reasonable and in line with fees charged for other comparable code based training courses.

(6) Training courses are approved for a three-year period.

(7) A provider, whose courses are approved, must give the department literature describing the courses so the department can share this information to prospective applicants.

(8) It is the responsibility of the provider to annually review and update its courses and to notify the department of any changes.

(9) The department may withdraw its approval of any training course if it determines the provider is no longer in compliance with the requirements of this chapter. If the department withdraws its approval of a training course, it must give the provider written notification of the withdrawal specifying the reasons for its decision. If the department withdraws its approval of a training course the provider may request a hearing before the advisory board at the next regularly scheduled meeting. Any information supporting the provider's position must be submitted to the board at least twenty days before the meeting at which the hearing will be held. At the hearing the department and the provider may produce witnesses and give testimony. The hearing must be conducted according to chapter 34.05 RCW. The board must base its decision upon the testimony and evidence presented and must notify the parties immediately upon reaching its decision. A majority of the board is necessary to render a decision.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-026, filed 5/28/04, effective 6/30/04. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-026, filed 6/17/98, effective 7/20/98.]

**WAC 296-400A-027 Where can I obtain information regarding department approved training course providers?** The department will produce a list of all approved training course providers and/or course contact persons. This list will be available to all applicants who request it. It will also be available at all department service locations.

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[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-027, filed 6/17/98, effective 7/20/98.]

### **WAC 296-400A-028 What are the requirements for continuing education and classroom training?**

#### **What are the general and continuing education course requirements for journeyman, residential specialty plumbers, domestic pump specialty plumbers, and plumber trainees?**

(1) Journeyman, residential specialty plumber, domestic pump specialty plumber, and plumber trainee.

(a) To be eligible for renewal of a journeyman plumber or residential specialty plumber certificate, the individual must have completed at least sixteen hours of approved continuing education for each two years of the prior certification period. Individuals will be required in the prior two-year period to have completed at least eight hours of plumbing code and at least four hours of electrical code from the currently adopted Washington state plumbing and electrical codes. The remaining four hours may be plumbing or electrical trade related classes.

(b) Domestic pump specialty plumbers shall renew their domestic pump specialty certificate once every three years, on or before the individual's birthday. Individuals will be required to complete at least four hours of approved continuing education in plumbing for each year prior to the certification period and at least four hours of approved continuing education in electrical for each year prior to the certification.

(c) Plumber trainees must complete at least eight hours per year of classroom training from an approved continuing education course for each year of the prior certification period. Trainee will be required during a two-year period to complete at least eight hours of plumbing code and at least four hours of electrical code from the currently adopted Washington state plumbing and electrical codes. The remaining four hours may be plumbing or electrical trade related classes.

Domestic pump specialty plumber trainee must have eight hours of plumbing continuing education and eight hours of electrical continuing education, which totals sixteen hours of continuing education for a two-year renewal.

(d) Any portion of a year of a prior plumber certification period is equal to one year for the purposes of the required continuing education.

(2) An individual will not be given credit for the same approved continuing education course taken more than once in the two years prior to the renewal date. No credit will be granted for any course not approved by the department.

(3) Continuing education requirements do not apply to backflow specialty plumbers under chapter 18.106 RCW and this chapter.

**Note:** Subsections (1), (2) and (3) of this section take effect July 1, 2005.

#### **Approval process - continuing education course.**

(4) The advisory board of plumbers or plumbing board subcommittee will review each continuing education course. The advisory board of plumbers or plumbing board subcommittee will recommend approval or disapproval to the department.

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ment. The department will either approve or disapprove the course.

(5) To be considered for approval, a continuing education course must consist of not less than two hours of instruction and must be open to monitoring by a representative of the department and/or the plumbing board at no charge. If the department determines that the continuing education course does not meet or exceed the minimum requirements for approval, the department may revoke the course approval or reduce the number of credited hours.

(6) Approved courses must be based on:

(a) Currently adopted edition of the *Uniform Plumbing Code and National Electrical Code*;

(b) Chapters 18.106 or 19.28 RCW or chapters 296-400A or 296-46B WAC; or

(c) Materials and methods as they pertain to the industrial practices of plumbing or electrical construction, building management systems, plumbing or electrical maintenance, or workplace health and safety.

(7) Code-update courses must be based on the entire currently adopted Uniform Plumbing Code or National Electrical Code.

#### **Application - for continuing education course approval.**

(8) All applications for course approval must be on forms provided by the department. The plumbing board and the department will only consider the written information submitted with the application when considering approval of the continuing education training course.

(9) The department will provide continuing education application forms to sponsors upon request. The course sponsor must submit an original completed application for course approval and three copies (unless submitted electronically using department prescribed technology) to the department. The department must receive the complete course application from the sponsor in writing at least forty-five days before the first class requested for approval is offered.

(10) A complete application for course approval must include:

(a) The appropriate course application fee;

(b) Course title, number of classroom instruction hours, and whether the training is open to the public;

(c) Sponsor's name, address, contact's name and phone number;

(d) Course outline (general description of the training, including specific Uniform Plumbing Code or National Electrical Code articles referenced);

(e) Lists of resources (texts, references, visual aids);

(f) Names and qualifications of instructors. Course instructors must show prior instructor qualification and experience similar to that required by the work force training and education coordinating board under chapter 28C.10 RCW;

(g) Any additional documentation to be considered; and

(h) A sample copy of the completion certificate issued to the course participants.

(11) The course sponsor seeking approval of a continuing education course will be notified of the subcommittee's decision within five days of the completed review of the application.

(12) If the application is not approved, the rejection notice will include an explanation of the reason(s) for rejection.

If the course sponsor disagrees with the subcommittee's decision, the course sponsor may request a reconsideration hearing by the full plumbing board. A request to appeal course rejection must be received by the department forty-five days before a regularly scheduled board meeting. The course sponsor must submit, to the department, any additional information to be considered during the hearing, in writing, at least thirty days before the board hearing. The course sponsor must provide at least twenty copies of any written information to be submitted to the board.

#### **Offering - continuing education course.**

(13) The course sponsor may offer an approved course for up to three years without additional approval. However, if the course is classified as code-update or code-related and a new edition of the *Uniform Plumbing Code* or *National Electrical Code* is adopted within the course approval period, the course approval will be considered automatically revoked and the course sponsor must submit a new application for review by the department and approval by the plumbing board subcommittee.

(14) A continuing education course attended or completed by an individual before final approval by the plumbing board subcommittee cannot be used to meet the plumbing certificate renewal requirements.

#### **Documentation - Washington approved training course attendance/completion.**

(15) The department is not responsible for providing verification of an individual's continuing education history with the course sponsor.

(16) The course sponsor must provide the department with an accurate and typed course attendance/completion roster for each course given.

(a) The attendance/completion roster must be provided within thirty days of course completion.

(b) In addition, the course sponsor must provide the attendance/completion roster in an electronic format provided by the department.

(c) The attendance/completion roster must show each participant's name, Washington certificate number, course number, location of course, date of completion, and instructor's name. The typed roster must contain the signature of the course sponsor's authorized representative.

(17) If the course sponsor fails to submit the required attendance/completion rosters within thirty days of the course completion, the department may revoke or suspend the course approval.

(18) Course sponsors must award a certificate to each participant completing the course from which the participant will be able to obtain:

(a) Name of course sponsor;

(b) Name of course;

(c) Date of course;

(d) Course approval number;

(e) The number of continuing education units; and

(f) The type of continuing education units.

(19) The department will only use a copy of the sponsor's attendance/completion roster as final evidence that the participant completed the training course.

(20) The department will keep submitted rosters of the continuing education courses on file only for audit purposes. The department is not responsible for the original of any completion certificate issued.

**Documentation - out-of-state training course attendance/completion.**

(21) To apply continuing education units earned out-of-state from course sponsors who do not have state of Washington approved courses, one of the following conditions must be met:

(a) The individual must request that the course sponsor submit a complete continuing education course application and requirements as described in this section for in-state courses.

Application for course approval will not be considered more than three years after the date of the course.

(b) The department must have entered into a reciprocal agreement with the state providing course approval.

The participant must provide a copy of an accurate and completed award or certificate from the course sponsor identifying the course location, date of completion, participant's name, and Washington certificate number. The department will only accept a copy of the sponsor's certificate or form as evidence that the participant attended and completed the course.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-028, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-028, filed 5/28/04, effective 6/30/04.]

**WAC 296-400A-029 What is the implementation schedule for the continuing education course requirements?**

- Individuals that renew between July 1, 2005, and June 30, 2006, are required to complete eight hours of continuing education courses.
- Effective July 1, 2006, all renewals will require sixteen hours of continuing education.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-029, filed 5/28/04, effective 6/30/04.]

**WAC 296-400A-030 Do I need a temporary permit?** You need a temporary permit if you are an active out-of-state journeyman plumber, domestic pump specialty plumber, or a residential specialty plumber residing in a state that does not have a reciprocal agreement with Washington and you would like to work as a plumber in Washington. Temporary permits are not issued for installers of medical gas piping systems.

Temporary permits are not issued for the backflow assembly maintenance and repair specialty. Therefore, WAC 296-400A-030 through 296-400A-033 do not apply to this specialty.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-030, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-030, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW, 02-14-074, § 296-400A-030, filed 6/28/02, effective 7/1/02. Statutory Authority: Chapter 18.106 RCW, 98-13-126, § 296-400A-030, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270, 97-11-052, § 296-400A-033, filed 5/20/97, effective 6/30/97.]

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125, [18.106.]140 and [18.106.]270, 97-11-052, § 296-400A-030, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-031 How do I qualify for a temporary permit?** To qualify for a temporary permit, you must:

(1) Have an active state-issued journeyman plumber, domestic pump specialty plumber, or a residential specialty plumber certificate;

(2) Give the department sufficient qualifying evidence for a journeyman plumber, domestic pump specialty plumber, or a residential specialty plumber certificate of competency;

(3) Never have taken the journeyman plumber, domestic pump specialty plumber, or a residential specialty plumber competency examination in Washington state; and

(4) Not be an apprentice plumber.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-031, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-031, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW, 02-14-074, § 296-400A-031, filed 6/28/02, effective 7/1/02. Statutory Authority: Chapter 18.106 RCW, 98-13-126, § 296-400A-031, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270, 97-11-052, § 296-400A-031, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-032 How do I obtain a temporary permit?** If you qualify, you can obtain a temporary permit by applying to the department and paying both the examination application fee and the temporary permit fee shown in WAC 296-400A-045.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270, 97-11-052, § 296-400A-032, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-033 What is the duration of a temporary permit?** A temporary permit is valid for ninety days and is nonrenewable.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270, 97-11-052, § 296-400A-033, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-035 How can I be placed on inactive status?** To be placed on inactive status, you must meet these three requirements:

(1) You must currently be a certified plumber;

(2) Have your inactive status request submitted and approved by the department prior to the expiration date of your plumbing certificate; and

(3) Not be working in the plumbing trade.

Inactive status means that you are not currently working in the plumbing trade and you are not required to pay the annual certificate renewal fee. If you have been in inactive status for less than five years, you may return to active status, without reexamination, by paying the reinstatement fee shown in WAC 296-400A-045. If you have been in inactive status for five or more years, you are required to reapply and pass the competency examination pursuant to WAC 296-400A-020 and pay the appropriate fees shown in WAC 296-400A-045.

(4) Required to meet a minimum of sixteen hours continuing education with four of the hours being in electrical training before being reinstated.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-035, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-035, filed 6/28/02, effective 7/1/02. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-035, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-035, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-036 How can I maintain my plumbing certificate as an honorary accomplishment?** (1) To maintain your plumbing certificate as an honorary accomplishment, you must meet the following four requirements:

(a) You must renew your certificate on or before your renewal date and pay the current fee as established in WAC 296-400A-045.

(b) You must provide the department with a signed affidavit stating you aren't working in the plumbing trade.

(c) The affidavit must state you are not acting in a supervisory manner for any person working in the plumbing trade.

(2) If you return to work, you must provide the proper documentation of sixteen hours continuing education with a minimum of eight hours plumbing code, a minimum of four hours industry-related electrical, and four hours industry-related plumbing from the approved list of courses from the department of labor and industries plumbing certification program.

(3) If you are found working in the plumbing trade while your certificate is in honorary status, your certificate will be revoked.

[Statutory Authority: RCW 18.106.040, 18.106.140. 06-24-040, § 296-400A-036, filed 11/30/06, effective 12/31/06.]

**WAC 296-400A-045 What fees will I have to pay?**

The following are the department's plumbers fees:

(1) Fees related to journeyman and specialty plumber certification:

<u>Type of Fee</u>	<u>Period Covered by Fee</u>	<u>Dollar Amount of Fee</u>
Examination application	Per examination	\$122.00
Domestic pump specialty application fee*****	Per application	\$122.00
Reciprocity application*	Per application	\$122.00
Trainee certificate**	One year	\$36.50
Domestic pump specialty trainee certificate**	Two years	\$73.00
Temporary permit (not applicable for backflow assembly maintenance and repair specialty)	90 days	\$60.70
Journeyman or residential specialty certificate***	Two years (fee may be prorated based on months)	\$97.70
Domestic pump specialty plumber certificate***	Three years (fee may be prorated based on months)	\$146.55
Backflow assembly maintenance and repair specialty certificate	Two years (fee may be prorated based on months)	\$67.50
Medical gas endorsement application	Per application	\$45.00
Medical gas endorsement***	One year	\$33.60
Medical gas endorsement examination fee****		See note below.
Medical gas endorsement training course fee*****		See note below.
Domestic pump specialty examination fee****		See note below.
Reinstatement fee for residential and journeyman certificates		\$195.80
Reinstatement fee for backflow assembly maintenance and repair specialty certificates		\$112.70
Reinstatement fee for domestic pump		\$293.10
Replacement fee for all certificates		\$16.60
Refund processing fee		\$26.40
Unsupervised trainee endorsement		\$26.40
Inactive status fee		\$26.40
Honorary plumbing certification		\$97.70
Certified letter fee		\$26.40
Continuing education new course fee*****		\$158.80
Continuing education renewal course fee*****		\$79.30

<u>Type of Fee</u>	<u>Period Covered by Fee</u>	<u>Dollar Amount of Fee</u>
Continuing education classes provided by the department		\$12 per continuing education training hour \$8 per continuing education training hour for correspondence and internet courses
* Reciprocity application is only allowed for applicants that are applying work experience toward certification that was obtained in state(s) with which the department has a reciprocity agreement. The reciprocity application is valid for one year.		
** The trainee certificate shall expire one year from the date of issuance and must be renewed on or before the date of expiration. The domestic pump specialty trainee certificate shall expire two years from the date of issuance and must be renewed on or before the date of expiration.		
*** This fee applies to either the original issuance or a renewal of a certificate. If you have passed the plumbers certificate of competency examination or the medical gas piping installer endorsement examination and paid the certificate fee, you will be issued a plumber certificate of competency or a medical gas endorsement that will expire on your birth date. The annual renewal of a Medical Gas Piping Installer Endorsement shall include a continuity affidavit verifying that brazing work has been performed biannually.		
**** This fee is paid directly to a nationally recognized testing agency under contract with the department. It covers the cost of preparing and administering the written competency examination and the materials necessary to conduct the practical competency examination required for the medical gas piping system installers endorsement. <b>This fee is not paid to the department.</b>		
***** This fee is paid directly to a training course provider approved by the department, in consultation with the state advisory board of plumbers. It covers the cost of providing training courses required for the medical gas piping system installer endorsement. <b>This fee is not paid to the department.</b>		
***** This fee is for a three-year period or code cycle.		
***** The domestic pump specialty application is valid for one year.		

(2) If your birth year is:

(a) In an even-numbered year, your certificate will expire on your birth date in the next even-numbered year.

(b) In an odd-numbered year, your certificate will expire on your birth date in the next odd-numbered year.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-045, filed 11/30/06, effective 12/31/06. Statutory Authority: Chapters 18.106, 43.22, and 70.87 RCW. 06-10-066, § 296-400A-045, filed 5/2/06, effective 6/30/06. Statutory Authority: RCW 19.103.040, 18.106.140, and chapter 18.106 RCW. 05-11-061, § 296-400A-045, filed 5/17/05, effective 6/30/05. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-045, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 43.22.350, 43.22.434, 43.22.480, 43.22.500, 70.87.030, 18.106.070, 18.106.125, 2001 c 7, and chapters 18.106, 43.22, and 70.87 RCW. 03-12-045, § 296-400A-045, filed 5/30/03, effective 6/30/03. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-045, filed 6/28/02, effective 7/1/02. Statutory Authority: RCW 18.106.125, 99-07-101, § 296-400A-045, filed 3/23/99, effective 4/23/99. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-045, filed 6/17/98, effective 7/20/98. Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW. 98-12-041, § 296-400A-045, filed 5/29/98, effective 6/30/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-045, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-050 When does the advisory board of plumbers meet?** The advisory board of plumbers meets every quarter on the third Tuesday of January, April, July and October.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-050, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-070 Can I work as a certified plumber in Washington without taking the Washington**

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**state plumbers' competency examination?** You may be eligible to work in Washington state without taking an examination if:

(1) You have a current plumbers certificate or license from another state; and

(2) That state has a current reciprocal agreement with the department of labor and industries; and

(3) You pay the reciprocity application fee and journeyman or specialty certificate fee shown in WAC 296-400A-045.

The director of labor and industries negotiates reciprocal agreements with states that have equivalent requirements for certification and licensing of journeyman and specialty plumbers. The agreement allows plumbers from those states to work in Washington and Washington-certified plumbers to work in the other state without taking competency examinations. To find out if your state has an agreement with the department, contact the plumber's certification clerk at the department's Tumwater, WA headquarters.

Reciprocity agreements cannot be used to take the Washington state competency examination instead of the examination in your home state.

(4)(a) Those actively certified by the department of health on or before July 1, 2001, as backflow assembly testers and registered as a contractor under chapter 18.27 RCW or employed by a registered contractor, may perform maintenance and repair of backflow prevention assemblies, without being a certified plumber under chapter 18.106 RCW and these rules, until January 1, 2003.

(b) After January 1, 2003, backflow assembly testers exempted under (a) of this subsection are required to meet the eligibility requirements for a specialty plumber's certificate of competency under chapter 18.106 RCW and these rules.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-070, filed 6/28/02, effective 7/1/02. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-070, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-070, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-100 For certification purposes, how are "years of employment" computed and documented?**

(1) For certification purposes, 2,000 hours of employment is considered one year. See RCW 18.106.070(2).

(2) When you renew your certificate, you must document your previous years' plumbing work by accurately completing the department's approved form and submitting it to the department.

(3) If you have completed a one, two, three, four or more years plumbing construction trainee program, you must have the necessary training hours for the year in which you are registered. See RCW 18.106.040.

(4) Subsections (1) through (3) of this section do not apply to the backflow assembly maintenance and repair specialty certification as years of employment are not required for this specialty. Applicants for this specialty designation are

required to have fulfilled the requirements in WAC 296-400A-122 and pay the applicable fees in WAC 296-400A-045(2).

(5) Experience obtained as a backflow assembly maintenance and repair specialty may not be applied toward journeyman or specialty plumber certification.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-100, filed 6/28/02, effective 7/1/02. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-100, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-110 Does previous work experience count toward my trainee certificate?** If your work experience was in plumbing construction, you will be given credit for all verifiable hours that are properly submitted on the department's approved form. Plumber trainee hours accumulated in the state of Washington will be credited only if an active Washington state trainee card was in place when the work occurred. (Refer to the definition of "plumbing" in WAC 296-400A-005.)

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-110, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-110, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-120 What do I need to know about plumber trainee certificates (excluding backflow assembly maintenance and repair specialty certification)? (1) Journeyman and specialty plumber trainee certification:**

(a) The department issues separate trainee certificates once a year.

(b) The plumbing trainee may not apply for renewal more than ninety days prior to the expiration date. Journeyman, residential specialty, and backflow specialty plumber trainee certificates are valid for one year. Domestic pump specialty plumber trainee certificate is valid for two years.

(c) All applicants for trainee certificate of renewal must:

(i) Submit a complete renewal application;

(ii) Pay all appropriate fees; and

(iii) Provide accurate evidence on the renewal form that the individual has completed the continuing education requirements described in chapter 296-400A WAC.

(d) If an individual files inaccurate or false evidence of continuing education information when renewing a plumbing trainee certificate, the individual's certificate may be suspended or revoked.

(e) An individual who has not completed the required hours of continuing education cannot renew a trainee certificate.

(f) Individuals will not be able to apply to test for journeyman plumber, domestic pump specialty plumber, or residential specialty plumber certificates until the continuing education requirements have been met.

(g) If continuing education hours have not been met, trainee certificates will become expired and any experience obtained by the trainee in expired status will not be credited toward plumbing certificate application.

(h) An individual may renew an expired certificate of competency by submitting a complete renewal application including obtaining and submitting the continuing education

required for renewal. However, the certificate will remain in an expired status for the duration of the expired period.

(i) An individual may not renew a revoked trainee certificate.

(j) Apprentices registered in an approved program according to chapter 49.04 RCW who are obtaining classroom training consistent with the continuing education requirements under chapter 18.106 RCW and this chapter, as approved by the department, are deemed to have met the continuing education requirements necessary to renew a trainee certificate.

(k) If you are a trainee applying for a journeyman certificate, you must complete a minimum of two of the required four years in commercial plumbing experience.

(l) A certified residential specialty plumber or domestic pump specialty plumber working on a commercial job site may work as a journeyman trainee only if they have a current trainee certificate on their person while performing commercial plumbing work.

(m) On a job site, the ratio of certified plumbers to non-certified plumbers must be:

(i) One residential specialty plumber or journeyman working on a residential plumbing job site may supervise no more than two trainees.

(ii) One journeyman plumber working on a commercial job site may supervise no more than one trainee or one residential specialty plumber who holds a current trainee certificate.

(iii) One appropriate domestic pump specialty plumber or one journeyman plumber working on a domestic pump system may supervise no more than two trainees.

(n) A plumber trainee who has a current trainee certificate with the state of Washington and has successfully completed or is enrolled in an approved medical gas piping installer training course may work on medical gas piping systems. Work may only occur when there is direct supervision by an active Washington state certified journeyman plumber with an active medical gas piping installer endorsement issued by the department. Supervision must be one hundred percent of the working day on a one-to-one ratio.

(2) **Trainee work hours.** Journeyman, residential specialty, and backflow specialty plumber trainee shall renew the certificate annually but not more than ninety days before the expiration date. Domestic pump specialty plumber trainee shall renew the certificate every two years but not more than ninety days before the expiration date.

(a) An annual fee shall be charged for the issuance or renewal of the certificate.

(b) The trainee will not be issued a renewed or reinstated training certificate if the individual owes the department money as a result of an outstanding final judgment.

(c) Trainee hours will not be credited if the trainee owes outstanding penalties for violations of this chapter.

(3) At the time of renewal, the holder shall provide the department with an accurate list of the holder's employers in the plumbing construction industry for the previous annual period. The individual must submit a completed, signed, and notarized affidavit(s) of experience. The affidavit of experience must accurately attest to:

(a) The plumbing installation work performed for each employer the individual worked for in the plumbing trade during the previous period;

(b) The correct plumbing category the individual worked in; and

(c) The actual number of hours worked in each category, worked under the proper supervision of a Washington certified journeyman plumber, certified domestic pump specialty plumber, or residential specialty plumber.

(4) The trainee should ask each employer and/or apprenticeship-training director for an accurately completed, signed, and notarized affidavit of experience for the previous certification period. The employer(s) or apprenticeship training director(s) must provide the previous period's affidavit of experience to the individual within twenty days of the request.

(5) If hours for previous period are not submitted within the thirty days after renewing a plumbing training certificate, the individual may not receive credit for these previous period hours.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-120, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-120, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW, 02-14-074, § 296-400A-120, filed 6/28/02, effective 7/1/02. Statutory Authority: Chapter 18.106 RCW, 98-13-126, § 296-400A-120, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270, 97-11-052, § 296-400A-120, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-121 What do I need to know about trainee experience and plumber examination requirements for the journeyman and specialty plumber (excluding the backflow assembly maintenance and repair specialty)?** (1) If you possess a trainee certificate:

(a) You may take the residential specialty plumber examination after completing 6,000 hours of documented training.

(b) You may take the journeyman examination after completing 8,000 hours of documented training which must include 4,000 hours of commercial plumbing experience.

(2) All journeyman trainees must work under the direct supervision of a journeyman plumber until they have completed 8,000 hours of training.

When 8,000 training hours have been completed, the trainee must take the journeyman examination. Any trainee who has failed the journeyman plumber examination cannot retake the examination for at least one month and must work under the direct supervision of a journeyman plumber until the examination is passed.

(3) To be eligible for the residential specialty plumber's examination, a residential specialty trainee must complete 6,000 hours of training under the direct supervision of either a certified specialty plumber or a journeyman plumber. Any residential specialty trainee who has failed the residential specialty examination, cannot retake the examination for at least one month and must work under the direct supervision of a certified plumber until the examination is passed.

(4) For domestic pump specialty plumbers:

(a) To be eligible for a limited volume domestic pump specialty plumbers examination defined by RCW 18.106.010

(10)(c), the trainee must complete 2,000 hours practical experience working under the direct supervision of a certified limited volume domestic pump specialty plumber, a certified unrestricted domestic pump specialty plumber, or a journeyman plumber on pumping systems not exceeding one hundred gallons per minute. The experience may be obtained at the same time the individual is meeting the experience required by RCW 19.28.191, or equivalent experience may be accepted as determined by rule by the department in consultation with the advisory board.

(b) To be eligible for an unrestricted domestic pump specialty plumbers examination defined by RCW 18.106.010 (10)(c), the trainee must complete 4,000 hours practical experience working under the direct supervision of a certified unrestricted domestic pump specialty plumber or a journeyman plumber on pumping systems. The experience may be obtained at the same time the individual is meeting the experience required by RCW 19.28.191 or equivalent experience may be accepted as determined by rule by the department in consultation with the advisory board.

(5) Effective January 1, 2005, all plumber trainees will be required to meet the current hour requirements to test.

**(6) Apprentice/trade school endorsement requirements.** An individual who has a current journeyman plumber, domestic pump specialty plumber, or residential specialty plumber trainee certificate and who has successfully completed or is currently enrolled in an approved apprenticeship program or in a technical school program in the plumbing construction trade in a school approved by the work force training and education coordinating board, may work without direct on-site supervision during the last six months of meeting the practical experience requirements of this chapter. In order to work without direct on-site supervision applicable to the type (residential or journeyman) of training hours for which certification is being sought by the individual, this individual must obtain an apprentice/trade school trainee endorsement by submitting the applicable forms provided by the department and paying the applicable fees. This individual may work without direct on-site supervision until he or she receives the remaining hours required to be eligible to take the applicable examination. This individual may not supervise trainees. (See RCW 18.106.070.)

**(7) Any applicant** (trainee, specialty plumber or journeyman) who fails an examination, will be required to wait at least until the next scheduled examination date and location. Examinations are held the first Thursday of every month, unless that date falls on a holiday. Applications shall be submitted and received by the plumbing certification program office two weeks before the next scheduled date.

[Statutory Authority: RCW 18.106.040, 18.106.140, 06-24-040, § 296-400A-121, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-121, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW, 02-14-074, § 296-400A-121, filed 6/28/02, effective 7/1/02. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270, 97-11-052, § 296-400A-121, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-122 What do I need to know about trainee experience and the backflow assembly maintenance and repair specialty examination requirements?**

(1) A trainee certificate must be obtained by an individual

performing backflow assembly maintenance and repair work who is not a certified plumber. The individual must work under the direct supervision of a certified backflow assembly maintenance and repair specialty, journeyman plumber, or residential specialty plumber for a minimum of one hundred percent of each working day while the backflow assembly maintenance and repair work is being performed.

(2) Each applicant for a backflow assembly maintenance and repair specialty certificate must furnish written evidence that he or she has a valid backflow assembly tester certification administered and enforced by the department of health.

(3) **Any applicant** who fails an examination will be required to wait at least until the next scheduled examination date and location. Examinations are held the first Thursday of every month, unless that date falls on a holiday. In the event of a holiday, the examination will be held on the second Thursday of the month. Applications shall be submitted and received by the plumbing certification program office two weeks before the next scheduled examination date.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-122, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-122, filed 6/28/02, effective 7/1/02.]

**WAC 296-400A-130 What if I make a false statement or a material misrepresentation on an application, an employment report or a trainee certificate?** (1) All required applications and annual statements of employment hours are made under oath. Making false statements and/or material misrepresentations carry serious consequences. Any person who knowingly makes a false statement or material misrepresentation on an application, an affidavit of experience or a trainee certificate may have their certificate suspended, revoked, and/or be referred to the county prosecutor for criminal prosecution. In addition, the department may issue an infraction for a violation of this chapter.

(2) The annual statements of employment described in subsection (1) of this section do not apply to the backflow assembly maintenance and repair specialty certification.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-130, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-130, filed 6/28/02, effective 7/1/02. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-130, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-135 How does the department enforce trainee supervision?** (1) A journeyman plumber on each and every commercial job site shall supervise either a residential specialty plumber or a domestic pump specialty plumber with a current plumber trainee card or trainee with a current plumber trainee card.

(a) The ratio on each commercial site shall be not more than one residential plumber or one plumber trainee working on any one job site for every certified journeyman plumber working as a journeyman plumber on that site.

(b) The time of supervision shall be a minimum of seventy-five percent of the time spent on each and every job site.

(2) A journeyman plumber or residential specialty plumber on each and every residential specialty job site shall

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supervise a plumber trainee with a current plumber trainee card.

(a) The ratio on each residential specialty job site shall be not more than two trainees with current plumber trainee cards on any one residential specialty job site for every certified journeyman plumber or residential specialty plumber on that site.

(b) The time of supervision shall be a minimum of seventy-five percent of the time spent on each and every job site.

(3) A journeyman plumber with current medical gas endorsement may supervise either a residential specialty plumber with a current trainee card or a plumber trainee with a current trainee card.

(a) The residential specialty plumber or the plumber trainee has to have successfully completed or is currently enrolled in an approved medical gas piping installer training course approved by the department.

(b) The residential specialty plumber or other plumber trainee is under the direct supervision of a certified medical gas journeyman plumber on one-to-one ratio for one hundred percent of the time on each and every medical gas site.

(4) A backflow specialty plumber, a journeyman plumber or a residential specialty plumber shall supervise a backflow trainee to do maintenance and repair work on every backflow assembly on potable water systems, inside every commercial or residential building. The ratio shall be one-to-one for one hundred percent of the time on every job site.

(5) A journeyman plumber or appropriate domestic pump specialty plumber on each and every domestic pump job site shall supervise a plumber trainee with a current plumber trainee card.

(a) The ratio on each domestic pump job site shall be not more than two trainees with current plumber trainee cards on any one residential specialty job site for every certified journeyman plumber or appropriate domestic specialty plumber on that site.

(b) The time of supervision shall be a minimum of seventy-five percent of the time spent on each and every job site. Restricted domestic pump specialty trainees who have completed at least seven hundred twenty hours of on-the-job training and passed the competency examination required by WAC 296-400A-020 may work unsupervised for the remainder of the time required for work experience to become a restricted domestic pump specialty plumber.

[Statutory Authority: RCW 18.106.040, 18.106.140. 06-24-040, § 296-400A-135, filed 11/30/06, effective 12/31/06. Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399. 04-12-046, § 296-400A-135, filed 5/28/04, effective 6/30/04.]

**WAC 296-400A-140 How does the department enforce plumbers certification requirements?** The department enforces plumber certification requirements by means of job-site inspections conducted by an authorized representative of the department. The representative must determine whether:

(1) Each person doing plumbing work has a proper certificate on their person; and

(2) The ratio of certified specialty and/or journeyman plumbers to certified trainees is correct; and

(3) Each certified trainee is directly supervised by either a certified specialty plumber or a certified journeyman; and

(4) Persons who are installing medical gas piping systems have active medical gas piping installer endorsements in addition to their active plumber certification.

(5) Persons who are certified as backflow assembly maintenance and repair specialties must have an active backflow assembly tester certification from the department of health.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-140, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-140, filed 6/28/02, effective 7/1/02. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-140, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-140, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-150 May the department audit the records of a contractor?** Yes, for any reason such as: Dispatching, ratio, supervision, excessive hours, and certification. The department may audit the records of contractors as authorized under RCW 18.106.320 when the department has reason to believe that a violation of the plumbing certification laws has occurred.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-150, filed 5/28/04, effective 6/30/04.]

**WAC 296-400A-155 Audit of trainee hours.** (1) The department, under RCW 18.106.320, may audit the employment records of the plumbing contractor or employer who verified the plumbing trainee hours.

(2) Every contractor must keep a record of trainee employment so the department may obtain the necessary information to verify plumbing trainee work experience.

(a) The contractor must keep the records of jobs performed for a least five years.

(b) Upon request, these records must be made available to the department for inspection within seven business days.

(3) The contractor must maintain time cards or similar records to verify:

(a) The number of hours the trainee worked as a supervised trainee by category.

(b) The type of plumbing work the trainee performed (e.g., commercial or residential).

(4) Any information obtained from the trainee's contractor or employer during the audit under the provisions of RCW 18.106.320 is confidential and is not open to public inspection under chapter 42.17 RCW.

(5) The department's audit may include, but will not be limited to, the following:

(a) An audit to determine whether the trainee was employed by the contractor or employer during the period for which the hours were submitted, the actual number of hours the trainee worked, and the category of plumbing work performed; and

(b) An audit covering a specific time period and examination of a contractor's or employer's books and records which may include their reporting of the trainee's payroll hours required for industrial insurance, employment security or prevailing wage purposes.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-155, filed 5/28/04, effective 6/30/04.]

**WAC 296-400A-300 What procedures does the department follow when issuing a notice of infraction?** (1) If an authorized representative of the department determines that an individual has violated plumber certification requirements, including medical gas piping installer endorsement requirements, the department must issue a notice of infraction describing the reasons for the infraction.

(2) For plumber certification violations, the department may issue a notice of infraction to either:

(a) An individual who is plumbing without a current plumber certificate; or

(b) The employer of the individual who is plumbing without a current plumber certificate; or

(c) The employer's authorizing agent or foreman that made the work assignment to the individual who is plumbing without a current plumber certificate.

(3) For medical gas piping installer endorsement violations, the department may issue a notice of infraction to either:

(a) An individual who is installing medical gas piping systems without a current plumber certificate and a current medical gas piping installer endorsement; or

(b) The employer of the individual who is installing medical gas piping systems without a current plumber certificate and a current medical gas piping installer endorsement; or

(c) The employer's authorizing agent or foreman that made the work assignment to the individual who is installing medical gas piping systems without a current plumber certificate and a current medical gas piping installer endorsement.

(4) The department may issue an infraction to a contractor advertising or performing work under this chapter or chapter 18.27 RCW who is not properly registered under chapter 18.27 RCW.

(5) An individual may appeal a notice of infraction by complying with the appropriate provisions of RCW 18.106.-220.

(6) If good cause is shown, an administrative law judge may waive, reduce or suspend any monetary penalties resulting from the infraction.

(7) Any monetary penalties collected under this chapter, must be deposited in the plumbing certificate fund.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-300, filed 5/28/04, effective 6/30/04. Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-300, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-300, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-400 What are the monetary penalties for violating certification requirements?** (1) A person cited for an infraction under RCW 18.106.020 or 18.106.320 shall be assessed a monetary penalty based upon the following schedule:

(a) Individual

First Infraction	\$250.00
Second Infraction	\$500.00
Third Infraction	\$750.00
Fourth and each additional infraction	Not more than \$1,000.00

## (b) Contractor or dispatcher

First Infraction	\$250.00
Second Infraction	\$500.00
Third and each additional infraction	Not more than \$1,000.00

(2) Each day a person is in violation is considered a separate infraction.

(3) Each job site at which a person is in violation is considered a separate infraction.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-400, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-400, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-425 What if I owe outstanding penalties related to a department issued plumber infraction?**

The department may deny your application or renewal of your certificate or endorsement if you owe outstanding penalties. The department must notify you of their denial by registered mail, return receipt requested. This notice of denial will be mailed to the address on your application.

Upon receipt of the notice, you have twenty days to file a notice of appeal with the department. Your notice of appeal must be accompanied by a certified check for two hundred dollars. This amount will be returned to you if the department's decision is not upheld by the hearings officer. If the hearings officer upholds the department's decision, the two hundred dollars will be applied to the cost of the hearing.

The office of administrative hearings shall conduct the hearing under chapter 34.05 RCW.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2002 c 82, and 2003 c 399, 04-12-046, § 296-400A-425, filed 5/28/04, effective 6/30/04. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-425, filed 5/20/97, effective 6/30/97.]

**WAC 296-400A-430 If I am a certified backflow assembly maintenance and repair, journeyman, or specialty plumber do I need to be a registered contractor under chapter 18.27 RCW?** Anyone who advertises, offers to do work, submits a bid, or performs any work under chapter 18.106 RCW and these rules must be a registered contractor as required under chapter 18.27 RCW, or an employee of such a registered contractor, with wages as their sole compensation.

[Statutory Authority: RCW 18.106.040, 18.106.140, 2001 c 281, and chapter 18.106 RCW. 02-14-074, § 296-400A-430, filed 6/28/02, effective 7/1/02.]

**Chapter 296-403A WAC**  
**AMUSEMENT RIDES OR STRUCTURES**  
 (Formerly chapter 296-403 WAC)

**WAC**

296-403A-100	Definitions.
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296-403A-120	Application for and renewal of operating permit.
296-403A-130	Operating permit.
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296-403A-150	Fees.
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296-403A-170	Amusement ride inspector qualifications.
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296-403A-190	Safety standards for amusement rides and amusement structures.
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296-403A-200	Reciprocal certificate.
296-403A-210	Revocation and suspension of certification of amusement ride inspectors—Reinstatement.
296-403A-220	Fees for examination, certification, and renewal of certification for inspectors.
296-403A-230	Electrical requirements for amusement rides and amusement structures.
296-403A-240	Department on-site electrical inspection.

**WAC 296-403A-100 Definitions.** Definitions as found in ASTM F 747-97 Standard Terminology Related to Amusement Rides and Devices are adopted in addition to the following:

(1) **"Air supported"** structure or device means an amusement device that incorporates a structural and mechanical system and employs a high-strength fabric or film that achieves its strength, shape and stability by pretensioning with internal air pressure (inflation).

(2) **"Amusement ride"** means any vehicle, boat, or other mechanical or air supported device moving upon or within a structure, along cables or rails, through the air by centrifugal force or otherwise, or across water, that is used to convey one or more individuals for amusement, entertainment, diversion, or recreation. For purposes of this chapter, "boats" does not refer to personal watercraft or vessels operated on the waters of this state according to chapter 79A.60 RCW. Examples of an amusement ride include, but are not limited to, devices commonly known as skyrides, ferris wheels, carousels, parachute towers, tunnels of love, roller coasters, mechanical bulls, gyrotron, space balls, bungee operated, simulators and similar devices.

Conveyances for persons in recreational winter sports activities such as: Ski lifts, ski tows, j-bars, t-bars, and similar devices subject to regulation under chapter 70.88 RCW are not amusement rides. Any single-passenger coin-operated ride that is manually, mechanically, or electrically operated and customarily placed in a public location that does not normally require the supervision or services of an operator is not an amusement ride. Nonmechanized playground equipment including, but not limited to, swings, seesaws, stationary spring-mounted animal features, rider-propelled merry-go-rounds, climbers, slides, trampolines, and physical fitness devices are not amusement rides. Permanent water slides are not amusement rides. Animal rides such as: Pony rides, riding stables, hay rides and elephant rides are not amusement rides.

(a) **"Portable amusement ride"** means an amusement ride which is relocated at least once per year with or without disassembly.

(b) **"Permanent amusement ride"** means an amusement ride which is erected to remain a lasting part of the premises.

(3) **"Amusement structure"** means any electrical, mechanical, nonmechanical, or air-supported device or any combinations thereof operated for revenue and to provide amusement or entertainment to viewers or audiences at carnivals, fairs, or amusement parks. A game or concession where a member of the public performs an act or makes a purchase is not an amusement structure. Examples of an amusement

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structure include, but are not limited to, structures commonly known as permanent steel or wooden roller coasters, a permanent dark ride or fun house, a permanent drop tower, or a permanent building enclosing a portable amusement device.

(4) **"ASTM"** means the American Society for Testing and Materials (F-24 committee) as it relates to amusement rides and devices. Copies of the ASTM are available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428-2959.

(5) **"Authority having jurisdiction"** means the department.

(6) **"Carnival"** means a mobile enterprise principally devoted to offering amusement or entertainment to patrons in, upon, or by means of portable amusement rides or structures.

(7) **"Certificate of inspection"** means a document given under oath or affirmation from an insurer or a person with whom the insurer has contracted to make a safety inspection of the amusement ride or structure. The certificate must contain: The name, address and signature of the inspector, the complete description of the amusement ride or structure and the name and address of the owner or operator.

(8) **"Certificate of insurance"** means a document certifying that the insurance required by chapter 67.42 RCW is in effect. Copies of this document/form are available from the department upon request.

(9) **"Department"** means the department of labor and industries.

(10) **"Insurance policy"** means an insurance policy written by an insurer authorized to do business in this state under Title 48 RCW.

(11) **"Major modification"** means any change to the original configuration or layout of components or replacement of components that are not like-for-like.

(12) **"NEC"** means the 2002 edition of the National Electrical Code (NFPA 70-2002) including Annex A, B, and C, but excluding Article 80. Copies of the NEC, NFPA 70-2002 are available from the NFPA (National Fire Protection Association), 1 Batterymarch Park, Quincy, Massachusetts 02169-7471.

(13) **"Operating permit"** means a permit that is issued by the department.

(14) **"Operating permit decal"** is a decal issued by the department that must be affixed on or adjacent to the control panel of the amusement ride or structure in a location visible to the patrons of the ride or structure.

(15) **"RCW"** means the *Revised Code of Washington*. Copies of RCWs are available from the office of the code reviser.

(16) **"Safety inspection"** means a procedure to be conducted by a safety inspector to determine whether an amusement ride or device is assembled, maintained, tested, operated, and inspected in accordance with the current ASTM standards, the manufacturer's or insurer's standards, and this chapter, whichever is the most stringent, and that determines the current operational safety of the ride or device.

(17) **"Safety inspector"** and **"amusement ride inspector"** both mean a third-party inspector authorized by the department to conduct safety inspections of amusement rides or devices in compliance with this chapter. The inspector must be an independent, third party with no organizational,

managerial, financial, design, or promotional affiliation with the amusement ride or amusement structure being inspected. The inspector must not be a principal, owner, or employee of any amusement company or manufacturer doing business in the state of Washington, unless authorized by the department to conduct specific inspections on a case-by-case basis.

Inspectors who have installed, modified or repaired an amusement ride or structure may not perform the initial inspection on the equipment they have installed, modified, or repaired. The inspector must have an adequate diversity of clients or activity so that the loss or award of a specific contract regarding amusement ride or amusement structure safety certification would not be a deciding factor in the financial well being of the inspector.

(18) **"WAC"** means the *Washington Administrative Code*. Copies of WACs are available from the department and the office of the code reviser.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-100, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-110 Insurance.** The following are the requirements for insurance for amusement rides and structures:

(1) An original copy of the insurance policy in an amount not less than one million dollars per occurrence from an insurer authorized to do business in the state of Washington must be filed with the department.

(2) A certificate of insurance must be presented to either the sponsor, lessor, landowner or other person responsible for an amusement ride being offered for use by the public.

(3) The insurance company must notify the department at least thirty days before canceling or revoking a policy and upon the nonrenewal of the policy.

(4) If the insurance company withdraws, cancels, revokes, suspends, or excludes coverage of any ride(s) from any policy furnished to the department, such withdrawal, cancellation, revocation, suspension, or exclusion must be plainly stated in documents furnished to the department.

(5) The department must be notified within twenty-four hours of the withdrawal, cancellation, revocation, suspension, or exclusion of insurance coverage of an amusement ride or structure for which an operating permit has been issued by the department.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-110, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-120 Application for and renewal of operating permit.** (1) The person(s) making application for an operating permit for an amusement structure or an amusement ride must provide the following documentation on an application form provided by the department and pay the appropriate fee:

(a) The name, address and telephone number of the owner or operator of the amusement ride or structure together with the name and signature of the applicant.

(b) Description of amusement ride or structure. Each amusement ride or structure must be individually identified:

(i) By a trade name or title and a narrative description from which the amusement structure or ride can be identified; and

(ii) A serial number which is welded onto the frame or contained on an identification plate which is permanently affixed to the amusement structure or ride.

(c) Certificate of inspection. The amusement ride inspector or insurer per RCW 67.42.020(2) must certify that the amusement ride or structure has been inspected for safety and meets the standards for compliance with all applicable requirements of the National Electrical Code and this chapter, manufacturer's specifications, American Society of Testing and Materials (ASTM) Standards on Amusement Rides and Devices, and insurance company inspection requirements.

(d) Amusement rides or structures that undergo major modification must be recertified by an amusement ride inspector or insurer per RCW 67.42.020(2) before being placed into operation.

(2) Renewal of operating permit. An operating permit may be renewed before the expiration date by submitting an application with the proper fee and a certificate of safety inspection. The safety inspection must have been performed within thirty days before the expiration date of the operating permit.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-120, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-130 Operating permit.** An amusement ride or structure must not be operated unless the owner or operator has obtained an operating permit and an operating permit decal is posted on the ride, unless a temporary operating permit has been issued as outlined in WAC 296-403A-140. The owner or operator of the amusement ride or structure must have available for inspection, at the location where the amusement ride or structure is to be operated, a copy of the operating permit for each amusement ride or structure. Each operating permit that has been issued to an owner or operator is valid for one year from the date of issue or the date of inspection whichever is less, unless revoked. The operating permit will become null and void in the event that the insurance policy is canceled or is no longer in effect or if an amusement ride or structure is materially rebuilt or materially modified.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-130, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-140 Temporary operating permit.** A temporary operating permit expires after fifteen days and will not be renewed or extended unless authorized by the chief electrical inspector. The department electrical section may issue a temporary operating permit when:

(1) The insurance policy required by chapter 67.42 RCW is on file with the department; and

(2) The safety inspection of the amusement ride or structure has been performed within the last year; and

(3) The department has received a complete application for an operating permit.

(2007 Ed.)

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-140, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-150 Fees.** The fee for issuing each operating permit (including bungee jumping operating permits) and operating permit decal is ten dollars.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-150, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-160 Appeals.** (1) Decisions by the department under this chapter can be appealed when:

(a) An operating permit has been denied or revoked.

(b) The department has ordered the cessation of the operation of an amusement ride or structure.

(c) An amusement ride inspector application has been denied, or certificate has been suspended or revoked.

The appeal will be conducted in accordance with chapter 34.05 RCW. An appeal does not stay the decision of the department. The appeal must be filed within twenty days after notice of the decision of the department is sent by certified mail, return receipt requested, or is served upon the owner or operator.

(2) An appeal is made by filing a written notice of appeal with the department's chief electrical inspector and must state the decision by the department that is being appealed and the relief that is desired. The formal appeal must be accompanied by a certified check for two hundred dollars which will be returned to the holder of the certificate or permit if the department's decision is overturned. If the department's decision is not overturned, the two hundred dollars will be applied to pay the costs associated with the appeal, and any balance remaining after payment of per diem and expenses will be paid into the electrical license fund.

(3) All requests for appeals must be filed with the department's chief electrical inspector, Department of Labor and Industries, 7273 Linderson Way, P.O. Box 44460, Olympia, WA 98504-4460. The filings may be submitted by ordinary mail, certified or registered mail, or by personal delivery. The date of filing is the date the paper is actually received in the office of the chief electrical inspector.

(4) See chapter 34.05 RCW and chapter 10-08 WAC for additional information on appeals.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-160, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-170 Amusement ride inspector qualifications.** An amusement ride inspector must meet the following minimum qualifications:

(1) Two years experience with an insurance company as an amusement ride inspector; or

(2) Two years experience inspecting amusement rides and enforcing amusement ride codes while employed by a state or other governmental body regulating amusement rides; or

(3) Not less than five years documented field operating and maintenance experience with amusement rides and

devices, including responsibility for erection, assembly, disassembly; personnel supervision responsibility for erection, maintenance, and operating functions; or

(4) Not less than ten years documented practical experience in the design, construction, maintenance, repair, field inspection, and operation of amusement rides and devices as an authorized representative of a recognized amusement ride manufacturer; and

(5) In addition to the above criteria an amusement ride inspector must be certified by the department after demonstrating competency by:

(a) Passing a competency examination administered by the department; or

(b) Passing a test administered by the National Association of Amusement Ride Safety Officials for NAARSO Level II or other certification organizations recognized by the department, as an amusement ride inspector.

Those individuals who are certified by the department before December 31, 2000, will have until December 31, 2003, to take and successfully pass one of the examinations in (a) or (b) of this subsection. Individuals with at least ten years as an amusement ride inspector may become certified without testing if they were certified with the department on December 31, 2000.

(6) An amusement ride inspector may work without certification, as a trainee, if directly and continually supervised during the inspection process by a certified amusement ride inspector.

(7) This section does not apply to insurers or a person with whom the insurer has contracted with per RCW 67.42.-020(2).

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-170, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-180 Safety and maintenance seminar.** Every amusement ride inspector must annually attend at least one amusement ride safety and maintenance seminar sponsored by the Amusement Industry Manufacturers and Equipment Suppliers, Northwestern Showman's Club, National Association of Amusement Ride Safety Officials, International Association of Amusement Parks and Attractions, or an equivalent approved by the department. All experience and schooling must be documented and verified and must be furnished to the department with an application for an amusement ride inspector certificate.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-180, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-190 Safety standards for amusement rides and amusement structures.** (1) A certified amusement ride inspector will inspect amusement rides and structures for safety. Amusement rides and structures must comply with all applicable requirements of the National Electrical Code and this chapter, manufacturer's specifications, American Society of Testing and Materials (ASTM) Standards on Amusement Rides and Devices, insurance company

inspection requirements, and the requirements established by the local authority having jurisdiction.

(2) The amusement ride inspector must verify the correction of all deficiencies noted on the application for an amusement ride operating decal. The correction of any deficiencies must be completed within fifteen calendar days unless the inspector has determined that deficiencies are of a serious nature that will prohibit operation of the amusement ride or amusement structure. The period to correct deficiencies may be extended for a specific period at the discretion of the safety inspector and/or the department. The amusement ride inspector must report to the department any amusement ride or structure that is not allowed to operate because of serious safety deficiencies. Any deficiencies must be reinspected by the amusement ride inspector/company or other qualified inspector/company authorized by the original ride inspector/company.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-190, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-195 Incident reporting.** (1) Amusement structure/ride owner(s) and/or operator(s) must report to the department:

(a) Any incident or accident where evacuation of a ride results from an electrical or mechanical malfunction or when emergency personnel are required to assist in the evacuation; and

(b) Any incident/accident involving an amusement ride or structure involving personal injury that requires medical treatment, other than ordinary first aid. Medical treatment other than ordinary first aid means treatment beyond that which occurs at the location of the incident/accident and is provided by or under the supervision of a physician licensed to practice medicine, and the treatment is in response to a medical concern that is related directly to the incident/accident.

(2) Reports meeting the above criteria must be made in writing within twenty-four hours after any incident/accident. This report may be faxed to a phone number supplied by the department followed by the original report in the mail. The report must include a detailed description of all available facts regarding the incident/accident for review by the department. After review, the department may require the amusement ride or structure to be inspected by an amusement ride inspector before continuing the operation of the ride or structure. When the department revokes a ride operating permit, a complete and detailed account of the incident/accident must be provided to the department before a new operating permit will be issued following an incident/accident.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-195, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-200 Reciprocal certificate.** The department may upon proper application, issue an amusement ride inspector certificate to an individual who meets the minimum qualifications as set forth in this chapter and who possesses a current, valid amusement ride inspector certifi-

cate in a state or province which has equal or higher standards for amusement ride inspectors as those contained in this chapter. No amusement ride inspection examination will be required of those persons who qualify for a reciprocal amusement ride inspector certificate.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-200, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-210 Revocation and suspension of certification of amusement ride inspectors—Reinstatement.**

(1) An amusement ride inspector's certificate of competency may be suspended or revoked for cause such as: Certifying the safety of an unsafe ride, falsifying records or reports or certifying an amusement ride or structure which he or she has not personally inspected.

(2) The suspension or revocation of a certificate of competency that is not contested will be suspended or revoked immediately. If the suspension or revocation of a certificate of competency is contested, the suspension or revocation will not occur until after a hearing has been held before the department. The inspector and his or her employer are entitled to appear at such hearings and to be heard.

(3) The department must deliver to both the inspector charged and to his or her employer (if known), not less than ten days prior to the hearing, a written notice of the charges and of the time and place of such hearing.

(4) An inspector whose certificate of competency has been suspended may apply for reinstatement not less than ninety days after the time of suspension. If the certificate of competency has been revoked, the inspector will need to reapply for certification according to this chapter.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-210, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-220 Fees for examination, certification, and renewal of certification for inspectors.** (1) Fee for each application for inspector's certificate of competency and examination, one hundred dollars.

(2) Application fee (nonrefundable), twenty dollars.

(3) Fee for annual renewal of certificate of competency or reciprocal inspector certificate, twenty dollars.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-220, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-230 Electrical requirements for amusement rides and amusement structures.**

(1) Electrical distribution system. Service equipment, separately derived systems, feeders and circuits for each amusement ride, amusement structure or concession must comply with all applicable requirements of the National Electrical Code and chapter 296-46A WAC, as amended.

(2) Flexible multiconductor cords must be connected to equipment by approved connectors designed for the purpose or by listed cord caps. Individual conductors of multiconductor cords in sizes #2 AWG and larger are permitted to be connected by listed and labeled connection systems in accor-

dance with Article 520-53(k) of the National Electrical Code. Where conductors are connected individually by such connection systems, the outer jacket of multiconductor cord must be secured to the electrical equipment independent from the receptacles and plugs by approved cable grips that are installed in a manner to prevent pressure from being applied to the receptacles and plugs.

(3) Individual, single conductor, insulated, portable power cable, in addition to complying with Section 525-13 of the National Electrical Code, must comply with the following:

(a) All conductors of the feeder or circuit including the equipment grounding conductor must originate in the same electrical equipment and terminate in the same equipment.

(b) All conductors of the feeder or circuit including the ungrounded, grounded, and equipment grounding conductors must run together, except for portions installed within approved cable protection systems.

(c) The cables must be secured to the electrical equipment independent from the cable receptacles and plugs by approved cable grips that prevent pressure from being applied to the connectors.

(d) The cables must be connected to electrical equipment by approved listed and labeled connection systems in compliance with Section 520-53(k) of the National Electrical Code.

(4) Disconnecting means. A separate, enclosed, externally operable fused switch or circuit breaker must be installed on each amusement ride, structure or concession to disconnect all electrical equipment. The disconnecting means must be readily accessible and identified as the disconnecting means. The disconnecting means is not required to be readily accessible when a disconnecting means meeting the requirements of NEC 525-30 is also installed. Where more than one power supply is employed, the disconnecting means must be grouped.

(5) Rotating equipment. Components of amusement rides or structures that rotate more than three hundred sixty degrees and which have electrically operated equipment, must be supplied by approved collector rings that are totally enclosed or located so they are accessible to authorized personnel only. The collector rings must be factory produced with an equipment grounding segment having a voltage and current rating that equals or exceeds the rating of the current carrying segments. Collector rings must have an ampacity not less than one hundred twenty-five percent of the full-load current of the largest device served plus the full-load current of all other devices served. Collector rings for control and signal purposes must have an ampacity not less than one hundred twenty-five percent of the full-load current of the largest device served plus the full-load current of all other devices served.

(6) Equipment grounding. All noncurrent carrying metal parts of amusement rides and structures must be grounded by an equipment grounding conductor routed with the feeder or circuit conductors in accordance with the National Electrical Code and these rules. The metallic structure must not be used as a current carrying conductor.

EXCEPTION: The metallic structure is permitted to be used as the return path for low voltage systems that do not exceed thirty volts, provided that the ungrounded conductors are protected by an overcurrent device in accordance

with the National Electrical Code and the system is factory built for such use.

(7) Existing concessions or games electrical systems must comply with the National Electrical Code and must be maintained in full compliance with codes and standards in effect at the time they were manufactured. When new concessions or games are purchased, manufactured or constructed, or where existing concessions or games have major modification, the electrical system must comply with this chapter and the edition of the National Electrical Code in effect at the time. All concessions and games must be identified in or on the disconnecting means and in records furnished to the department with the edition of the National Electrical Code the electrical system is intended to comply with, or be certified and labeled by the department as a factory assembled structure.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-230, filed 10/22/02, effective 11/22/02.]

**WAC 296-403A-240 Department on-site electrical inspection.** (1) Department electrical inspection will be done each time an amusement ride or structure is set up. Fees will be paid in accordance with chapter 296-46A WAC, as amended. An on-site electrical inspection permit and fee is not required for any amusement ride or structure when all of the following conditions are met:

(a) The ride is equipped with a supply cord that does not exceed 120 volts or 20 amps.

(b) The amusement ride inspector, on the operating permit application, has documented the size and length of the supply cord.

(c) No extension cords are used to supply the equipment.

(d) The amusement ride or structure has a current amusement ride operating permit decal.

(2) Itinerary for set-up locations must be made available to the chief electrical inspector upon request.

(3) Amusement rides that are leased and set up for private use (not operated for revenue) must also comply with the following in addition to the on-site inspection and operating permit requirements established by this chapter:

(a) The lessor must provide the lessee with manufacturer's set up instructions.

(b) The lessor or their authorized agent is responsible for providing proper set up and tear down of each amusement ride or structure (authorized agents must be under written contract to the owner or operator).

(c) The lessor is responsible to maintain proper documentation assuring that each lessee has been provided with proper manufacturer's instructions for operating and setting up each individual leased amusement ride or structure.

[Statutory Authority: RCW 19.28.010, 19.28.031, 19.28.061, 19.28.101, 19.28.171, 19.28.191, 19.28.201, 19.28.251, 19.28.271, 19.28.311, 19.28.321, 67.42.020, 67.42.025, 67.42.050, and chapters 19.28 and 67.42 RCW. 02-21-103, § 296-403A-240, filed 10/22/02, effective 11/22/02.]

## Chapter 296-800 WAC

### SAFETY AND HEALTH CORE RULES

#### WAC

296-800-100 Introduction.

[Title 296 WAC—p. 2686]

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#### FIRST-AID SUMMARY

296-800-150	Rule summary.
296-800-15005	Make sure that first-aid trained personnel are available to provide quick and effective first aid.
296-800-15020	Make sure appropriate first-aid supplies are readily available.
296-800-15030	Make sure emergency washing facilities are functional and readily accessible.
296-800-15035	Inspect and activate your emergency washing facilities.
296-800-15040	Make sure supplemental flushing equipment provides sufficient water.

#### PERSONAL PROTECTIVE EQUIPMENT (PPE)

296-800-160	Summary.
296-800-16005	Do a hazard assessment for PPE.
296-800-16010	Document your hazard assessment for PPE.
296-800-16015	Select appropriate PPE for your employees.
296-800-16020	Provide PPE to your employees.
296-800-16025	Train your employees to use PPE.
296-800-16030	Retrain employees to use PPE, if necessary.
296-800-16035	Document PPE training.
296-800-16040	Require your employees to use necessary PPE on the job.
296-800-16045	Keep PPE in safe and good condition.
296-800-16050	Make sure your employees use appropriate eye and face protection.
296-800-16055	Make sure your employees use appropriate head protection.
296-800-16060	Make sure your employees use appropriate foot protection.
296-800-16065	Make sure your employees use appropriate hand protection.
296-800-16070	Make sure your employees are protected from drowning.

#### EMPLOYER—CHEMICAL HAZARD COMMUNICATION INTRODUCTION

296-800-170	Employer chemical hazard communication—Introduction.
296-800-17005	Develop, implement, maintain, and make available a written Chemical Hazard Communication Program.
296-800-17007	Include multiemployer workplaces in your program if necessary.
296-800-17010	Identify and list all the hazardous chemicals present in your workplace.
296-800-17015	Obtain and maintain material safety data sheets (MSDSs) for each hazardous chemical used.

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- 296-800-17020 Make sure material safety data sheets (MSDSs) are readily accessible to your employees and NIOSH.
- 296-800-17025 Label containers holding hazardous chemicals.
- 296-800-17030 Inform and train your employees about hazardous chemicals in your workplace.
- 296-800-17035 Follow these rules for laboratories using hazardous chemicals.
- 296-800-17040 Follow these rules for handling chemicals in factory-sealed containers.
- 296-800-17045 Translate certain chemical hazard communication documents upon request.
- 296-800-17050 Attempt to obtain a material safety data sheet (MSDS) upon request.
- 296-800-17055 Items or chemicals exempt from the rule, and exemptions from labeling.
- 296-800-180 Material safety data sheets (MSDSs) as exposure records.
- 296-800-18005 Preserve exposure records for at least 30 years.
- 296-800-18010 Inform current employees of exposure records.
- 296-800-18015 Provide access to exposure records.
- 296-800-18020 Transfer records when ceasing to do business.

**SAFETY BULLETIN BOARD**

- 296-800-190 Summary/rule.
- 296-800-19005 Provide a safety bulletin board in your workplace.

**WISHA POSTER**

- 296-800-200 WISHA poster.
- 296-800-20005 Post and keep a WISHA poster in your workplace.

**LIGHTING**

- 296-800-210 Lighting.
- 296-800-21005 Provide and maintain adequate lighting.

**HOUSEKEEPING, DRAINAGE, AND STORAGE**

- 296-800-220 Housekeeping, drainage, and storage—Summary.

**HOUSEKEEPING**

- 296-800-22005 Keep your workplace clean.
- 296-800-22010 Sweep and clean your workplace to minimize dust.
- 296-800-22015 Keep your workplace free of obstacles that interfere with cleaning.
- 296-800-22020 Control pests in your workplace.
- 296-800-22022 Make sure floors are maintained in a safe condition.

**DRAINAGE**

- 296-800-22025 Keep your workroom floors dry, when practical.
- 296-800-22030 Provide proper drainage.

**STORAGE AREAS**

- 296-800-22035 Store things safely.
- 296-800-22040 Control vegetation in your storage areas.

**SANITATION AND HYGIENE FACILITIES AND PROCEDURES**

- 296-800-230 Summary.

**DRINKING WATER**

- 296-800-23005 Provide safe drinking (potable) water in your workplace.
- 296-800-23010 Clearly mark the water outlets that are not fit for drinking (nonpotable).
- 296-800-23015 Make sure that systems delivering not-fit-for-drinking (nonpotable) water prevent backflow into drinking water systems.

**BATHROOMS AND WASHING FACILITIES**

- 296-800-23020 Provide bathrooms for your employees.
- 296-800-23025 Provide convenient and clean washing facilities.

**EATING AREAS AND FOOD SERVICE**

- 296-800-23040 Make sure eating areas are safe and healthy.
- 296-800-23045 Follow these requirements if you provide food service to your employees.

**GARBAGE AND WASTE DISPOSAL**

- 296-800-23050 Dispose of garbage and waste safely.
- 296-800-23055 Remove garbage and waste in a way that does not create a health hazard.

**LUNCHROOMS AND PERSONAL SERVICE ROOMS**

- 296-800-23060 Provide a separate lunchroom if employees are exposed to toxic substances if they are allowed to eat and drink on the job site.
- 296-800-23065 Provide showers when required for employees working with chemicals.
- 296-800-23070 Provide change rooms when required.
- 296-800-23075 Make sure any work clothes you provide are dry.

**ENVIRONMENTAL TOBACCO SMOKE IN THE OFFICE**

- 296-800-240 Summary.
- 296-800-24005 Prohibit tobacco smoke in your office work environment.

**STAIRS AND STAIR RAILINGS SUMMARY**

- 296-800-250 Summary.
- 296-800-25005 Provide fixed stairs where required.
- 296-800-25010 Provide stairs that minimize hazards.
- 296-800-25015 Provide handrails and stair railings.

**FLOOR OPENINGS, FLOOR HOLES AND OPEN-SIDED FLOORS**

- 296-800-260 Summary.
- 296-800-26005 Guard or cover floor openings and floor holes.
- 296-800-26010 Protect open-sided floors and platforms.

**WORKPLACE STRUCTURAL INTEGRITY**

- 296-800-270 Summary.
- 296-800-27005 Do not overload floors or roofs.
- 296-800-27010 Make sure that floors are safe.
- 296-800-27015 Make sure floors can support equipment that moves or has motion.
- 296-800-27020 Post approved load limits (weight limits) for floors.

**BASIC ELECTRICAL RULES**

- 296-800-280 Basic electrical rules.
- 296-800-28005 Inspect all electrical equipment your employees use to make sure the equipment is safe.
- 296-800-28010 Make sure all electrical equipment is used for its approved or listed purpose.
- 296-800-28015 Make sure electrical equipment used or located in wet or damp locations is designed for such use.
- 296-800-28020 Make sure electrical equipment that is not marked is not used.
- 296-800-28022 Identify disconnecting means.
- 296-800-28025 Maintain electrical fittings, boxes, cabinets and outlets in good condition.
- 296-800-28030 Maintain all flexible cords and cables in good condition and use safely.
- 296-800-28035 Guard electrical equipment to prevent your employees from electrical hazards.
- 296-800-28040 Make sure electrical equipment is effectively grounded.
- 296-800-28045 Make sure electrical equipment has overcurrent protection.

**PORTABLE FIRE EXTINGUISHERS**

- 296-800-300 Summary—Portable fire extinguishers.
- 296-800-30005 Provide portable fire extinguishers in your workplace.
- 296-800-30010 Select and distribute portable fire extinguishers in your workplace.
- 296-800-30015 Make sure that portable fire extinguishers are kept fully charged, in operable condition, and left in their designated places.
- 296-800-30020 Inspect and test all portable fire extinguishers.
- 296-800-30025 Train your employees to use portable fire extinguishers.

**EXIT ROUTES AND EMPLOYEE ALARM SYSTEMS**

- 296-800-310 Summary.

**EXIT ROUTES**

- 296-800-31005 Provide an adequate number of exit routes.
- 296-800-31010 Make sure that exit routes are large enough.
- 296-800-31015 Make sure that exit routes meet their specific design and construction requirements.
- 296-800-31020 Make sure that each exit route leads outside.
- 296-800-31025 Provide unobstructed access to exit routes.
- 296-800-31030 Exit doors must be readily opened from the inside.
- 296-800-31035 Use side-hinged doors to connect rooms to exit routes.
- 296-800-31040 Provide outdoor exit routes that meet these requirements.

296-800-31045	Minimize danger to employees while they are using emergency exit routes.	296-800-15025	Provide a first-aid station when required. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].-050. 01-11-038, § 296-800-15025, filed 5/9/01, effective 9/1/01.] Repealed by 04-07-160, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060.
296-800-31050	Mark exits adequately.		
296-800-31053	Provide adequate lighting for exit routes and signs.		
296-800-31055	Maintain the fire retardant properties of paints or other coatings.		
296-800-31060	Maintain emergency safeguards.	296-800-23030	Keep containers used for garbage or waste in a sanitary condition. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-23030, filed 5/9/01, effective 9/1/01.] Repealed by 03-18-090, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-800-23050.
296-800-31065	Maintain exit routes during construction and repair.		
296-800-31067	Provide doors in freezer or refrigerated rooms that open from the inside.		
296-800-31070	Install and maintain an appropriate employee alarm system.		
296-800-31075	Establish procedures for sounding emergency alarms.		
296-800-31080	Test the employee alarm system.	296-800-23035	Remove garbage and waste in a way that does not create a health hazard. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-23035, filed 5/9/01, effective 9/1/01.] Repealed by 03-18-090, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. Later promulgation, see WAC 296-800-23055.
<b>ACCIDENT REPORTING AND INVESTIGATING</b>			
296-800-320	Summary.		
296-800-32005	Report the death, probable death of any employee, or the in-patient hospitalization of 2 or more employees within 8 hours.		
296-800-32010	Make sure that any equipment involved in an accident is not moved.		
296-800-32015	Assign people to assist the department of labor and industries.	296-800-24010	Control tobacco smoke that comes in from the outside. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-24010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-24010, filed 5/9/01, effective 9/1/01.] Repealed by 06-22-023, filed 10/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
296-800-32020	Conduct a preliminary investigation for all serious injuries.		
296-800-32025	Document the preliminary investigation findings.		
<b>RELEASING ACCIDENT INVESTIGATION REPORTS</b>			
296-800-330	Releasing accident investigation reports.		
<b>PROTECTING THE IDENTITY OF THE SOURCE OF CONFIDENTIAL INFORMATION</b>			
296-800-340	Protecting the identity of the source of confidential information.	296-800-290	Summary. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-290, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
<b>USING STANDARDS FROM NATIONAL ORGANIZATIONS AND FEDERAL AGENCIES</b>			
296-800-360	Rule.	296-800-29005	Inspect your portable metal ladders periodically. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-29005, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
296-800-36005	Comply with standards national organizations or of federal agencies when referenced in WISHA rules.		
296-800-370	Definitions.	296-800-29010	Make sure your portable metal ladders are kept in good condition. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-29010, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
<b>DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER</b>			
296-800-13005	Establish a safety committee or have safety meetings. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-13005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-13005, filed 5/9/01, effective 9/1/01.] Repealed by 02-16-047, filed 8/1/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].-050.	296-800-29015	Use your portable metal ladders safely. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].-050. 01-23-060, § 296-800-29015, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-29015, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
296-800-13010	Make sure that each meeting includes a discussion of established safety topics. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-13010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-13010, filed 5/9/01, effective 9/1/01.] Repealed by 02-16-047, filed 8/1/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-800-29020	Inspect your portable wooden ladders frequently. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-29020, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
296-800-13015	Make sure that safety committee meeting minutes are recorded and preserved. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-13015, filed 5/9/01, effective 9/1/01.] Repealed by 02-16-047, filed 8/1/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050.	296-800-29025	Make sure your portable wooden ladders are kept in a good condition. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-29025, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-29025, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
296-800-15010	Make sure first-aid training contains required subjects. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-15010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-15010, filed 5/9/01, effective 9/1/01.] Repealed by 04-07-160, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060.	296-800-29030	Use your portable wooden ladders safely and for their intended purpose. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-29030, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-29030, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.-040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
296-800-15015	Document your first-aid training. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-15015, filed 5/9/01, effective 9/1/01.] Repealed by 04-07-160, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060.		

- 296-800-29035 Safely use a portable wooden ladder when working more than 25 feet above ground. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-29035, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
- 296-800-29040 Use wooden stepladders safely. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-29040, filed 5/9/01, effective 9/1/01.] Repealed by 05-20-068, filed 10/4/05, effective 1/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-876 WAC.
- 296-800-350 Introduction. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-350, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-350, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-350, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35002 Types of workplace inspections. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35002, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35004 Scheduling inspections. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35004, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35006 Inspection techniques. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35006, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35008 Response to complaints submitted by employees or their representatives. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35008, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35010 Citations mailed after an inspection. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35010, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35012 Employees (or their representatives) can request a citation and notice. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35012, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35012, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35016 Posting a citation and notice and employee complaint information. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35016, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35018 Reasons to assess civil penalties. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35018, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35020 Minimum penalties. [Statutory Authority: RCW 49.17.-010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35020, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35022 Base penalty calculations—Severity and probability. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35022, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35024 Severity rate determination. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35024, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35026 Probability rate determination. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35026, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35026, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35028 Determining the gravity of a violation. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35028, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35030 Base penalty adjustments. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-35030, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-35030, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35030, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35032 Types of base penalty adjustments. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35032, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.-040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35038 Minimum and maximum adjusted base penalty amounts. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-35038, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].-050. 01-11-038, § 296-800-35038, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35040 Reasons for increasing civil penalty amounts. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-35040, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-35040, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-35040, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35040, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35042 Employers must certify that violations have been abated. [Statutory Authority: RCW 49.17.010, [49.17].-040, and [49.17].050. 01-11-038, § 296-800-35042, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.

- 296-800-35044 For willful, repeated, or serious violations, submit additional documentation. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35044, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35046 Submitting correction action plans. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35046, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35048 Submit progress reports to the department when required. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35048, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35048, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35049 WISHA determines the date by which abatement documents must be submitted. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35049, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35050 Inform affected employees and their representatives of abatement actions you have taken. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35050, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35050, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35052 Tag cited moveable equipment to warn employees of a hazard. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-18-080, § 296-800-35052, filed 8/31/04, effective 11/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35052, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35056 You can request more time to comply. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-35056, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-35056, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35062 WISHA's response to your request for more time. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-35062, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35062, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35062, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35063 Post the department's response. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35063, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35064 A hearing can be requested about the department's response. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-35064, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35064, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35064, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35065 Post the department's hearing notice. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35065, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35066 Hearing procedures. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35066, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35066, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35072 Post the hearing decision. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35072, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35076 Employers and employees can request an appeal of a citation and notice. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-35076, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-35076, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35078 Await the department's response to your appeal request. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35078, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35080 Department actions when reassuming jurisdiction over an appeal. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35080, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35082 Appealing a corrective notice. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-35082, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.
- 296-800-35084 Notify employees. [Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-35084, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-35084, filed 5/9/01, effective 9/1/01.] Repealed by 06-06-020, filed 2/21/06, effective 6/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. Later promulgation, see chapter 296-900 chapter.

**WAC 296-800-100 Introduction. The WISHA Core Rules: Your foundation for a safe and healthful workplace.** This book contains 26 basic safety and health rules that affect all employers and should cover almost everything small, nonmanufacturing employers need for a safe and healthful workplace. These core rules include requirements for your Accident Prevention Program, personal protective equipment, first aid, and hazard communication program.

**Note: You may need to comply with other WISHA rules. For a complete list of WISHA rules, see the resources section of this book.**

**Why does workplace safety and health matter to you?**

On average, two people lose their lives every week in job-related incidents in Washington state. Each year, more than 250,000 workers' compensation claims are accepted for work-related injuries and illnesses. Medical care and wage replacement for these injured workers costs more than a billion dollars. The indirect costs of workplace injuries are even larger in terms of lost quality of life, personal financial ruin, operating costs of business, and decreased profitability. Employers and employees who work together to identify and control hazards on the job can save lives and money while improving business and productivity.

**What are L&I and WISHA?**

The department of labor and industries (L&I) is a state agency that provides many different services:

- Workplace safety and health, including inspections and enforcement, consultation, technical assistance, training, education and grants. (WISHA)
- Workers' compensation (or industrial insurance), including claims management, rate setting, medical payments, and research.
- Specialty compliance services, including contractor registration, electrical inspections, boiler and elevator inspections, apprenticeship programs and employment standards.

Many of these services are available from L&I's twenty-two regional offices (see the resource section of this book for a list of regional offices).

In 1973, the legislature passed the Washington Industrial Safety and Health Act or WISHA (Revised Code of Washington (chapter 49.17 RCW)). WISHA requires employers to provide safe and healthful workplaces for all employees. It gives L&I the responsibility to establish and enforce workplace safety and health rules. These rules are the Washington Administrative Code (WAC).

**How does WISHA work?**

WISHA covers nearly all employers and employees in Washington, including employees who work for the state, counties, and cities. L&I inspectors enforce WISHA rules by inspecting workplaces without advance notice including investigations of work-related deaths, injuries, and employees' complaints. When WISHA inspectors find a violation in a workplace, they issue a citation to the employer and a penalty may be attached. If you have questions about whether you are covered by WISHA, call 1-800-4BE SAFE (1-800-423-7233) or a local office of L&I.

**What is OSHA and its relationship to WISHA?**

The U.S. Congress created the Occupational Safety and Health Administration (OSHA) in 1971 to develop and enforce workplace safety and health rules throughout the country. States may choose to run their own safety and health programs as long as they are at least as effective as OSHA. Washington state has chosen to run its own program and most employers in the state, therefore, are subject to enforcement by L&I and not by federal OSHA.

In Washington state, OSHA covers workplaces with federal employees, nonfederal employees working on federal reservations and military bases, employees working on floating worksites (floating dry docks, fishing boats, construction barges), and employees working for tribal employers on tribal lands.

**Does WISHA apply to you?**

WISHA applies to almost every employer and employee in Washington. WISHA applies to you if:

- You hire someone to work for you as an employee, including workers from a temporary agency.
- You are hired to work for someone as their employee.
- You own your own business or you are a corporate officer and have elected industrial insurance coverage for yourself.
- You have a contract with someone else that primarily involves personal labor, even though you are not required to pay industrial insurance or unemployment insurance premiums.
- You volunteer your personal labor, or you have volunteers working for you who receive any benefit or compensation.

If you have any questions about your particular situation, call **1-800-4BE SAFE (1-800-423-7233)** or contact your local office of L&I for help. See the resource section of this book for a complete list of L&I offices.

**Are there other safety and health rules I need to know about?**

In addition to the rules in the *WISHA Safety and Health Core Rules* book, there are other general WISHA rules that may apply to employers, depending upon the industry and workplace activities. See the resource section of this book for a complete list of WISHA rules or go to the web site for all the state rules administered by L&I at <http://www.wa.gov/lni/home/wacs.htm>. If you have questions about these rules or would like copies of them, call 1-800-4BE SAFE (1-800-423-7233) or your local office of L&I.

**How do the WISHA rules relate to fire, building and electrical codes?**

Fire codes: WISHA rules contain basic requirements for portable fire extinguishers, exit routes, housekeeping, storage, stairs and electrical hazards for the protection of employees in your workplace. The rules contained in this book are the most basic requirements to make sure that as an employer you provide a safe and healthy work environment. However, these are not the only rules regarding the requirements for portable fire extinguishers, exit routes, housekeeping, storage, stairs and electrical equipment. The fire marshal and local fire authorities enforce the Uniform Fire Code (UFC). WISHA and UFC differ in some areas, for example UFC requires exit sign lettering to be 6" or more and WISHA only states that the letters have to be clearly visible. Fire codes have more detailed and extensive requirements for the protection of the public than WISHA. Some codes overlap with WISHA requirements.

Building and electrical codes: WISHA rules are minimum requirements regardless of when the building was built or remodeled. Buildings must also comply with building and electrical codes at the time of construction. If you remodel, you must comply with the building and electrical codes applicable at that time. Building authorities and electrical inspection authorities enforce rules from the Uniform Building Code (UBC), and the National Electrical Code (NEC).

You are encouraged to call your local fire, building or electrical authority. For more information on the requirements in your area look in the government section of your

phone book. Copies of these codes are available at your local library.

#### How can WISHA help employers and employees?

Employers can ask WISHA safety and health consultation staff for free, confidential consulting services in your workplace. WISHA safety and health professionals can examine your workplace and make recommendations about how to comply with WISHA rules. If the consultant finds hazards, the employer will be given a reasonable period of time to correct the hazard without citation or penalty.

Sometimes you might have to wait for an appointment because of the demand for these services. You still must provide a safe workplace while you wait for a consultation.

WISHA offers a wide variety of free services:

- Safety and health workshops held in locations throughout the state
- A comprehensive safety and health video lending library
- Safety and health publications geared for both employer and employee
- Web site with on-line publications and learning opportunities

Note: By law, WISHA consultants do not have any enforcement authority.

Link: For more information, call 1-800-4BE SAFE (1-800-423-7233) or visit <http://www.wa.gov/lni/home/train-ing.htm>.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-100, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-100, filed 5/9/01, effective 9/1/01.]

### EMPLOYER RESPONSIBILITIES: SAFE WORKPLACE

#### WAC 296-800-110 Employer responsibilities: Safe workplace—Summary.

##### Your responsibility:

To provide a safe and healthy workplace free from recognized hazards.

##### IMPORTANT:

Use these rules where there are no specific rules applicable to the particular hazard.

You must:

Provide a workplace free from recognized hazards.

*WAC 296-800-11005.*

Provide and use means to make your workplace safe.

*WAC 296-800-11010.*

Prohibit employees from entering, or being in, any workplace that is not safe.

*WAC 296-800-11015.*

Construct your workplace so it is safe.

*WAC 296-800-11020.*

Prohibit alcohol and narcotics from your workplace.

*WAC 296-800-11025.*

Prohibit employees from using tools and equipment that are not safe.

*WAC 296-800-11030.*

Establish, supervise, and enforce rules that lead to a safe and healthy work environment that are effective in practice.

*WAC 296-800-11035.*

Control chemical agents.

*WAC 296-800-11040.*

Protect employees from biological agents.

*WAC 296-800-11045.*

Note: Employees may discuss and participate in any WISHA safety and health related practice and may refuse to perform dangerous tasks without fear of discrimination. Discrimination includes: Dismissal, demotion, loss of seniority, denial of a promotion, harassment, etc. see chapter 296-360 WAC, Discrimination pursuant to RCW 49.17.160, for a complete description of discrimination and the department's responsibility to protect employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-110, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-110, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-110, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-110, filed 5/9/01, effective 9/1/01.]

#### WAC 296-800-11005 Provide a workplace free from recognized hazards. You must:

- Provide your employees a workplace free from recognized hazards that are causing, or are likely to cause, serious injury or death.

Note: A hazard is recognized if it is commonly known in the employer's industry, or if there is evidence that the employer knew or should have known of the existence of the hazard, or if it can be established that any reasonable person would have recognized the hazard.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-11005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-11005, filed 5/9/01, effective 9/1/01.]

#### WAC 296-800-11010 Provide and use means to make your workplace safe. You must:

- Provide and use safety devices, safeguards, and use work practices, methods, processes, and means that are reasonably adequate to make your workplace safe.
  - Do not remove, displace, damage, destroy or carry off any safety device, safeguard, notice or warning, furnished for use in any employment or place of employment.
  - Do not interfere with use of any of the above.
  - Do not interfere with the use of any method or process adopted for the protection of any employee.
  - Do everything reasonably necessary to protect the life and safety of your employees.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-11010, filed 5/9/01, effective 9/1/01.]

#### WAC 296-800-11015 Prohibit employees from entering, or being in, any workplace that is not safe. You must:

- Prohibit employees from entering, or being in, any workplace that is not safe.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-11015, filed 5/9/01, effective 9/1/01.]

#### WAC 296-800-11020 Construct your workplace so it is safe. You must:

- Not construct, or cause to be constructed, a workplace that is not safe.
  - This rule applies to employers, owners, and renters of property used as a place of employment.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-11020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-11020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-11025 Prohibit alcohol and narcotics from your workplace.** You must:

- Prohibit alcohol and narcotics from your workplace, except in industries and businesses that produce, distribute, or sell alcohol and narcotic drugs.
- Prohibit employees under the influence of alcohol or narcotics from the worksite.

**EXEMPTION:** Employees who are taking prescription drugs, as directed by a physician or dentist, are exempt from this section, if the employees are not a danger to themselves or other employees.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-11025, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-11030 Prohibit employees from using tools and equipment that are not safe.**

**You must:**

- Take responsibility for the safe condition of tools and equipment used by employees.

**Note:** This applies to all equipment, materials, tools, and machinery whether owned by the employer or another firm or individual.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-11030, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-11030, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-11035 Establish, supervise, and enforce rules that lead to a safe and healthy work environment that are effective in practice.** You must:

- Establish, supervise, and enforce rules that lead to a safe and healthy work environment that are effective in practice.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-11035, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-11040 Control chemical agents.** You must:

- Control chemical agents in a manner that they will not present a hazard to your workers; or
- Protect workers from the hazard of contact with, or exposure to, chemical agents.

**Note:** Pesticides are considered to be chemical agents. As required by this rule, you must control them or provide protection to workers from exposure to pesticide hazards. Pesticide manufacturers supply precautionary statements in the information provided with the pesticide that tells you how to protect your workers from these hazards.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-11040, filed 8/1/02, effective 10/1/02.]

**WAC 296-800-11045 Protect employees from biological agents.**

**You must:**

- (1) Protect employees from exposure to hazardous concentrations of biological agents that may result from processing, handling or using materials or waste.

**Note:** Potential exposure to biological agents occurs during cleanup, or other tasks, where employees handle:

- Animals or animal waste
- Body fluids
- Biological agents in a medical research lab
- Mold or mildew

Check The Center of Disease Control web site (www.cdc.gov) to find published guidelines and information on safe

handling and protection from specific biological agents (examples: Hanta virus, TB).

**You must:**

- (2) Warn employees of biohazards.
    - Use signs, tags, or labels to identify:
      - The actual or potential presence of a biohazard;
- AND**

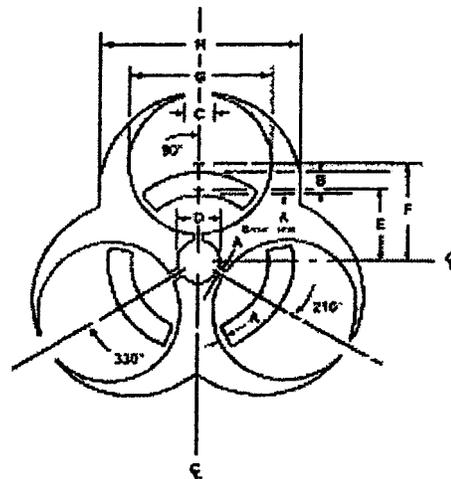
– Equipment, containers, rooms, materials, experimental animals, or any combinations of these that contain viable hazardous agents.

**Definition:**

**Biohazard** means those infectious agents presenting a risk or potential risk of death, injury or illness to employees.

**You must:**

- Make sure the sign, tag, or label includes the biohazard symbol that is designed and proportioned in the illustration that follows.



Dimension	A	B	C	D	E	F	G	H
Units	1	3 1/2	4	6	11	16	21	30

**You must:**

- Make sure that there is sufficient contrast for the symbol to be clearly defined, if the sign, tag, or label has a background color.

**Reference:** Additional requirements for biohazard signs, tags, and labels may apply. See WAC 296-823-14025 and 296-823-18040 of the *Bloodborne Pathogens* book.

- Note:**
- It's recommended that the sign, tag, or label have a key color of fluorescent orange or orange-red and lettering or symbols in a contrasting color.
  - Appropriate wording may be used in association with the symbol to indicate:
    - The nature or identity of the hazard;
    - Name of individual responsible for its control;
    - Precautionary information;
- OR**
- Other information.
  - This information should not be written on the symbol.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-18-080, § 296-800-11045, filed 8/31/04, effective 11/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-11045, filed 8/1/02, effective 10/1/02.]

**EMPLOYEE RESPONSIBILITIES**

**WAC 296-800-120 Rule.** Employee's responsibility: To play an active role in creating a safe and healthy workplace and comply with all applicable safety and health rules.

Note: Employees may discuss and participate in any WISHA safety and health related practice and may refuse to perform dangerous tasks without fear of discrimination. Discrimination includes: Dismissal, demotion, loss of seniority, denial of a promotion, harassment, etc. (see chapter 296-360 WAC, Discrimination) pursuant to RCW 49.17.160 for a complete description of discrimination and the department's responsibility to protect employees.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-120, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-120, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-12005 Employee responsibilities.** Employees must:

- Study and follow all safe practices that apply to their work.
- Coordinate and cooperate with all other employees in the workplace to try to eliminate on-the-job injuries and illnesses.
- Apply the principles of accident prevention in their daily work and use proper safety devices and protective equipment as required by their employment or employer.
- Take care of all personal protective equipment (PPE) properly.
- Not wear torn or loose clothing while working around machinery.

Note: Things such as clothing, hair, and jewelry can get caught in machinery and be a hazard on the job.

Employees must:

- Report promptly to their supervisor every industrial injury or occupational illness.
- Not remove, displace, damage, or destroy or carry off any safeguard, notice, or warning provided to make the workplace safe.
- Not interfere with use of any safeguard by anyone in the workplace.
- Not interfere with the use of any work practice designed to protect them from injuries.
- Do everything reasonably necessary to protect the life and safety of employees.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-12005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-12005, filed 5/9/01, effective 9/1/01.]

**SAFETY COMMITTEES AND SAFETY MEETINGS**

**WAC 296-800-130 Safety committees/safety meetings—Summary. Important:**

This rule requires you to have a method of communicating and evaluating safety and health issues brought up by you or your employees in your workplace. Larger employers **must** establish a safety committee. Smaller employers have the choice of either establishing a safety committee or holding safety meetings with a management representative present.

There is a difference between a safety committee and a safety meeting.

- A safety committee is an organizational structure where members represent a group. This gives everyone a voice but keeps the meeting size to an effective number of participants.

- A safety meeting includes all employees and a management person is there to ensure that issues are addressed. Typically, the safety committee is an effective safety management tool for a larger employer and safety meetings are more effective for a smaller employer.

**Your responsibility:**

To establish a safety committee or hold safety meetings to create and maintain a safe and healthy workplace for all employees.

You must:

Establish and conduct safety committees.

*WAC 296-800-13020.*

Follow these rules to conduct safety meetings.

*WAC 296-800-13025.*

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-130, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-130, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-13020 Establish and conduct safety committees.** You must:

<b>If:</b>	<b>Then:</b>
You employ 11 or more employees on the same shift at the same location	You must establish a safety committee

(1) Establish a safety committee.

- Make sure your committee:

- Has employee-elected and employer-selected members.

- ◆ The number of employee-elected members must equal or exceed the number of employer-selected members.

**Note:** Employees selected by the employees bargaining representative or union qualify as employee-elected.

- ◆ The term of employee-elected members must be a maximum of one year. (There is no limit to the number of terms a representative can serve.)

- ◆ If there is an employee-elected member vacancy, a new member must be elected prior to the next scheduled meeting.

- Has an elected chairperson.

- Determines how often, when, and where, the safety committee will meet.

**Note:**

- Meetings should be one hour or less, unless extended by a majority vote of the committee.
- If the committee cannot agree on the frequency of meetings, the department of labor and industries regional safety consultation representative should be consulted for recommendations. (See the resources section of this book for contacts.)

You must:

(2) Cover these topics:

- Review safety and health inspection reports to help correct safety hazards.

- Evaluate the accident investigations conducted since the last meeting to determine if the cause(s) of the unsafe situation was identified and corrected.

- Evaluate your workplace accident and illness prevention program and discuss recommendations for improvement, if needed.

- Document attendance.
- Write down subjects discussed.

(3) Record meetings.

- Prepare minutes from each safety committee and:
  - Preserve them for one year.

- Make them available for review by safety and health consultation personnel of the department of labor and industries.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-13020, filed 8/1/02, effective 10/1/02.]

**WAC 296-800-13025 Follow these rules to conduct safety meetings.** You must:

<b>If:</b>	<b>Then:</b>
You have 10 or fewer employees <b>OR</b> If you have 11 or more employees that <ul style="list-style-type: none"> <li>• Work on different shifts with 10 or fewer employees on each shift</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Work in widely separate locations with 10 or fewer employees at each location</li> </ul>	You may choose to hold a safety meeting instead of a safety committee

(1) Do the following for safety meetings.

- Make sure your safety meetings:

- Are held monthly. You may meet more often to discuss safety issues as they come up.

- Have at least one management representative.

(2) Cover these topics.

- Review safety and health inspection reports to help correct safety hazards.

- Evaluate the accident investigations conducted since the last meeting to determine if the cause(s) of the unsafe situation was identified and corrected.

- Evaluate your workplace accident and illness prevention program and discuss recommendations for improvement, if needed.

- Document attendance.

- Write down subjects discussed.

**Note:** There are no formal documentation requirements for safety meetings except for writing down who attended and the topics discussed.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-13025, filed 8/1/02, effective 10/1/02.]

**ACCIDENT PREVENTION PROGRAM**

**WAC 296-800-140 Accident prevention program.**

Summary.

Your responsibility: To establish, supervise and enforce an accident prevention program (APP) that is effective in practice. (You may call this your total safety and health plan.)

You must:

(2007 Ed.)

Develop a formal, written accident prevention program (APP).

*WAC 296-800-14005.*

Develop, supervise, implement, and enforce safety and health training programs that are effective in practice.

*WAC 296-800-14020.*

Make sure your accident prevention program (APP) is effective in practice.

*WAC 296-800-14025.*

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-140, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-14005 Develop a formal, written accident prevention program.** You must:

- Develop a formal accident prevention program that is outlined in writing. The program must be tailored to the needs of your particular workplace or operation and to the types of hazards involved.

**Note:** The term "accident prevention program" refers to your written plan to prevent accidents, illnesses, and injuries on the job. Your accident prevention program may be known as your safety and health plan, injury prevention program, or by some other name.

You must:

- Make sure your Accident Prevention Program contains at least the following elements:

- A safety orientation:

- ◆ A description of your total safety and health program.

- ◆ On-the-job orientation showing employees what they need to know to perform their initial job assignments safely.

- ◆ How and when to report on-the-job injuries including instruction about the location of first-aid facilities in your workplace.

- ◆ How to report unsafe conditions and practices.

- ◆ The use and care of required personal protective equipment (PPE).

- ◆ What to do in an emergency, including how to exit the workplace.

- ◆ Identification of hazardous gases, chemicals, or materials used on-the-job and instruction about the safe use and emergency action to take after accidental exposure.

- A safety and health committee.

*(WAC 296-800-130.)*

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-14005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-14020 Develop, supervise, implement, and enforce safety and health training programs that are effective in practice.** You must:

- Develop, supervise, implement, and enforce training programs to improve the skill, awareness, and competency of all your employees in the field of occupational safety and health.

- Make sure training includes on-the-job instruction to employees prior to their job assignment about hazards such as:

- Safe use of powered materials-handling equipment, such as forklifts, backhoes, etc.

- Safe use of machine tool operations.

- Use of toxic materials.

- Operation of utility systems.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-14020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-14025 Make sure your accident prevention program is effective in practice.** You must:

- Establish, supervise, and enforce your accident prevention program in a manner that is effective in practice.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-14025, filed 5/9/01, effective 9/1/01.]

### FIRST-AID SUMMARY

**WAC 296-800-150 Rule summary.** Your responsibility: Make sure first-aid trained personnel are available to provide quick and effective first aid.

You must:

Make sure that first-aid trained personnel are available to provide quick and effective first aid.

*WAC 246-800-15005 [296-800-15005].*

Make sure appropriate first-aid supplies are readily available.

*WAC 296-800-15020.*

Make sure emergency washing facilities are functional and readily accessible.

*WAC 296-800-15030.*

Inspect and activate your emergency washing facilities.

*WAC 296-800-15035.*

Make sure supplemental flushing equipment provides sufficient water.

*WAC 296-800-15040.*

**Note:**

- Employers who require their employees to provide first aid must comply with chapter 296-823 WAC, Occupational exposure to bloodborne pathogens.
- Your workplace may be covered by separate first-aid rules. If you do any of the types of work listed below, you must follow separate industry specific rules:

Industry	Chapter (WAC)
Agriculture	296-307
Compressed air	296-36
Construction	296-155
Fire fighting	296-305
Logging	296-54
Sawmill	296-78
Ship building and repairing	296-304

You can get copies of these rules by calling 1-800-4BE SAFE (1-800-423-7233), or by going to <http://www.lni.wa.gov>.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-07-160, § 296-800-150, filed 3/23/04, effective 5/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-150, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-150, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-15005 Make sure that first-aid trained personnel are available to provide quick and effective first aid.**

**You must:**

Comply with the first-aid training requirements of 29 CFR 1910.151(b) which states:

"In the absence of an infirmary, clinic, or hospital in near proximity to the workplace, which is used for the treatment of

all injured employees, a person or persons shall be adequately trained to render first aid."

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-07-160, § 296-800-15005, filed 3/23/04, effective 5/1/04; 03-09-110, § 296-800-15005, filed 4/22/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-15005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-15005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-15020 Make sure appropriate first-aid supplies are readily available.** You must:

- Make sure first-aid supplies are readily available.
- Make sure first-aid supplies at your workplace are appropriate to:

- Your occupational setting.
- The response time of your emergency medical services.

**Note:** First-aid kits from your local retailer or safety supplier should be adequate for most nonindustrial employers.

You must:

- Make sure that first-aid supplies are:
  - Easily accessible to all your employees.
  - Stored in containers that protect them from damage, deterioration, or contamination. Containers must be clearly marked, not locked, and may be sealed.
  - Able to be moved to the location of an injured or acutely ill worker.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-15020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-15030 Make sure emergency washing facilities are functional and readily accessible.** You must:

- Provide an emergency shower:
  - When there is potential for major portions of an employee's body to contact corrosives, strong irritants, or toxic chemicals.
  - That delivers water to cascade over the user's entire body at a minimum rate of 20 gallons (75 liters) per minute for fifteen minutes or more.
- Provide an emergency eyewash:
  - When there is potential for an employee's eyes to be exposed to corrosives, strong irritants, or toxic chemicals.
  - That irrigates and flushes both eyes simultaneously while the user holds their eyes open.
  - With an on-off valve that activates in one second or less and remains on without user assistance until intentionally turned off.
  - That delivers at least 0.4 gallons (1.5 liters) of water per minute for fifteen minutes or more.

**Note:** Chemicals that require emergency washing facilities:

- You can determine whether chemicals in your workplace require emergency washing facilities by looking at the material safety data sheet (MSDS) or similar documents. The MSDS contains information about first-aid requirements and emergency flushing of skin or eyes.
- For chemicals developed in the workplace, the following resources provide information about first-aid requirements:
  - NIOSH Pocket Guide to Chemical Hazards
  - \*DHHS (NIOSH) Publication No. 97-140
  - \*<http://www.cdc.gov/niosh/npq/ggdstart.html>
  - Threshold Limit Values for Chemical Substances and Physical Agents American Conference of Governmental Industrial Hygienists (ACGIH)

You must:

- Make sure emergency washing facilities:
  - Are located so that it takes no more than ten seconds to reach.
  - Are kept free of obstacles blocking their use.
  - Function correctly.
  - Provide the quality and quantity of water that is satisfactory for emergency washing purposes.

Note: • If water in emergency washing facilities is allowed to freeze, they will not function correctly. Precautions need to be taken to prevent this from happening.  
 • The travel distance to an emergency washing facility should be no more than fifty feet (15.25 meters).  
 • For further information on the design, installation, and maintenance of emergency washing facilities, see American National Standards Institute (ANSI) publication Z358.1 - 1998, *Emergency Eyewash and Shower Equipment*. Emergency washing facilities that are designed to meet ANSI Z358.1 - 1998 also meet the requirements of this standard. The ANSI standard can be obtained from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

Reference: • Training in the location and use of your emergency washing facilities is required under the employer chemical hazard communication rule, WAC 296-800-170, and the accident prevention program rule, WAC 296-800-140.  
 • All emergency washing facilities using "not fit for drinking" (nonpotable) water must have signs stating the water is "not fit for drinking." See WAC 296-800-23010.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-15030, filed 8/1/02, effective 10/1/02.]

**WAC 296-800-15035 Inspect and activate your emergency washing facilities.** You must:

- Make sure all plumbed emergency washing facilities are inspected once a year to make sure they function correctly.

Note: Inspections should include:  
 • Examination of the piping  
 • Making sure that water is available at the appropriate temperature and quality  
 • Activation to check that the valves and other hardware work properly  
 • Checking the water flow rate.

You must:

- Make sure plumbed emergency eyewashes and hand-held drench hoses are activated weekly to check the proper functioning of the valves, hardware, and availability of water
- Make sure all self-contained eyewash equipment and personal eyewash units are inspected and maintained according to manufacturer instructions.
  - Inspections to check proper operation must be done once a year
  - Sealed personal eyewashes must be replaced after the manufacturer's expiration date.

Note: Most manufacturers recommend replacing fluid in open self-contained eyewashes every six months. The period for sealed containers is typically two years.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-15035, filed 8/1/02, effective 10/1/02.]

**WAC 296-800-15040 Make sure supplemental flushing equipment provides sufficient water.**

Note: Supplemental flushing equipment cannot be used in place of required emergency showers or eyewashes.

You must:

- Make sure hand-held drench hoses deliver at least 3.0 gallons (11.4 liters) of water per minute for fifteen minutes or more.

Note: Why use a drench hose? A drench hose is useful when:  
 • The spill is small and does not require an emergency shower  
 • Used with a shower for local rinsing, particularly on the lower extremities.

You must:

- Make sure personal eyewash equipment delivers only clean water or other medically approved eye flushing solutions.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-15040, filed 8/1/02, effective 10/1/02.]

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

**WAC 296-800-160 Summary.** Your responsibility: To make sure that your employees have, use, and care for the appropriate personal protective equipment (PPE).

PPE is an item or items used to protect the eyes, face, head, body, arms, hands, legs, and feet such as goggles, helmets, head covers, gloves, rubber slickers, disposable coveralls, safety shoes, protective shields, and barriers.

You must:

- Do a hazard assessment for PPE.  
*WAC 296-800-16005.*
- Document your hazard assessment for PPE.  
*WAC 296-800-16010.*
- Select appropriate PPE for your employees.  
*WAC 296-800-16015.*
- Provide PPE to your employees.  
*WAC 296-800-16020.*
- Train your employees to use PPE.  
*WAC 296-800-16025.*
- Retrain employees to use PPE, if necessary.  
*WAC 296-800-16030.*
- Document PPE training.  
*WAC 296-800-16035.*
- Require your employees to use necessary PPE on the job.  
*WAC 296-800-16040.*
- Keep your PPE safe and in good condition.  
*WAC 296-800-16045.*
- Make sure your employees use appropriate face and eye protection.  
*WAC 296-800-16050.*
- Make sure your employees use appropriate head protection.  
*WAC 296-800-16055.*
- Make sure your employees use appropriate foot protection.  
*WAC 296-800-16060.*
- Make sure your employees use appropriate hand protection.  
*WAC 296-800-16065.*
- Make sure your employees are protected from drowning.  
*WAC 296-800-16070.*

Exemption: • WAC 296-800-16015, 296-800-16025, 296-800-16030, and 296-800-16035 do not apply to electrical protective equipment or respiratory protection. See chapters 296-24 WAC, Part L and chapter 296-842 WAC, for rules about these types of protective equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-800-160, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-160, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-160, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16005 Do a hazard assessment for PPE.** You must:

- Look for and identify hazards or potential hazards in your workplace and determine if PPE is necessary on the job.

Note: PPE alone should not be relied on to provide protection for your employees. PPE should be used after all other reasonable means of reducing hazards have been carried out. Identifying hazards in your workplace should be built into your regular routine. You should take active steps to get rid of all identified hazards. For example, you can:

- Consider other ways to get hazardous jobs done.
- Reduce hazardous materials or processes.
- Apply engineering controls to reduce or eliminate hazards.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16010 Document your hazard assessment for PPE.** You must:

- Verify that a hazard assessment for PPE has been done at your workplace and complete a written certification (paper or electronic format) that includes the:

- Name of the workplace
- Address of the workplace you inspected for hazards
- Name of person certifying that a workplace hazard assessment was done
- Date(s) the workplace hazard assessment was done
- Statement identifying the document as the certification of hazard assessment for PPE for the workplace

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16010, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16015 Select appropriate PPE for your employees.** You must:

- (1) Select appropriate PPE.
  - Select appropriate PPE for your employees if hazards are present, or likely to be present.
  - Select PPE for each at-risk employee to use for protection from the hazards identified in your workplace hazard assessment.
- (2) Select PPE that properly fits each at-risk employee.

Note: The hazards in your workplace have special rules that apply to them. For information about PPE for specific workplaces, see these WISHA rule books:

Construction Work	Chapter 296-155 WAC
Electrical Workers	Chapter 296-45 WAC
Fire Fighters	Chapter 296-305 WAC
General Occupational Health Standards	Chapter 296-62 WAC
General Safety and Health Standards	Chapter 296-24 WAC
Logging Operations	Chapter 296-54 WAC
Pulp, Paper and Paper Board Mills and Converters	Chapter 296-79 WAC

Ship Repairing, Ship Building and Shipbreaking	Chapter 296-304 WAC
Ski Area Facilities and Operations	Chapter 296-59 WAC
Telecommunication	Chapter 296-32 WAC
Textile Industry	Chapter 296-301 WAC

Note: For help in selecting PPE for your employees, you have several options. You may:

- Visit the OSHA web site <http://www.osha-slc.gov/SLTC/personalprotectiveequipment/index.html>.
- Call 1-800-4BE SAFE (1-800-423-7233) for guidelines for selecting PPE.
- Consult with safety and health professionals knowledgeable in this area. See resource section for links to professional organizations.
- Discuss PPE choices with your employees.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-16015, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-16015, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16020 Provide PPE to your employees.** You must:

- Provide PPE wherever hazards exist from:
  - Processes or the environment
  - Chemical hazards
  - Radiological hazards or
  - Mechanical irritants that could cause injury or impairment to the function of any body part through absorption, inhalation, or physical contact.
- Provide necessary PPE to employees at no cost to the employee if the PPE:
  - Will be used to protect against hazardous materials
  - Is the type that would not reasonably or normally be worn away from the workplace, such as single use or disposable PPE.

Note: Examples of PPE that the employer **must** provide are:

- Boots or gloves that could become contaminated with hazardous materials in the workplace.
- Safety glasses, goggles, and nonprescription protective eye wear.
- Goggles that fit over prescription eye wear.
- Hard hats.
- Full body harnesses and lanyards.
- Single use or disposable PPE such as plastic type gloves used in the food service or medical industries.

Examples of PPE that the employer may **not** have to provide are:

- Coats to protect against inclement weather.
- Leather boots, with or without steel toes, that will not become contaminated on the job.
- Prescription protective eye wear (except as part of a full face piece or hooded respirator).

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-16020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-16020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16025 Train your employees to use PPE.** You must:

- Communicate your PPE selection decision to each at-risk employee.
- Provide training to each employee who is required to use PPE on the job. Each affected employee must be trained to know at least the following:
  - When PPE is necessary
  - What PPE is necessary
  - How to put on, take off, adjust, and wear PPE

- Limitations of PPE
- Proper care, maintenance, useful life, and disposal of PPE.

- Make sure before an employee is allowed to perform work requiring the use of PPE that the employee can:

- Demonstrate an understanding of the training specified above; and
- Demonstrate the ability to use PPE properly.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-16025, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-16025, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16030 Retrain employees to use PPE, if necessary.** You must:

- Retrain an employee when you have reason to believe the understanding, motivation, and skills required to use the PPE has not been retained. Circumstances where retraining is required include:

- Changes in the workplace that make previous training out of date.
- Changes in the types of PPE to be used make previous training out of date.
- Work habits or demonstrated knowledge indicate that the employee has not retained the necessary understanding, skill, or motivation to use PPE.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16030, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16035 Document PPE training.** You must:

- Document in writing that each employee using PPE has received and understood the required training.

This documentation must include:

- Name of each employee
- Date(s) of training
- Subject of the training

Note: Documentation may be stored on a computer as long as it is available to safety and health personnel from the department of labor and industries.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16035, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16040 Require your employees to use necessary PPE on the job.** You must:

- Require your employees to use necessary PPE on the job.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16040, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16045 Keep PPE in safe and good condition.** You must:

- Make sure all PPE is safe for the work to be performed. It must:
  - Be durable.
  - Fit snugly.
  - Not interfere with the employee's movements.
- Make sure PPE is used and maintained in a clean and reliable condition.
  - Defective equipment MUST NOT be used.

(2007 Ed.)

- Make sure if employees provide their own PPE, that it is adequate for the workplace hazards, and maintained in a clean and reliable condition.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16045, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16050 Make sure your employees use appropriate eye and face protection.** You must:

- Make sure that employees exposed to hazards that could injure their eyes and/or face use appropriate protection. Examples of these hazards include:

- Flying particles.
- Molten metal.
- Liquid chemicals.
- Acids or caustic liquids.
- Chemical gases or vapors.
- Any light that could injure the eyes such as lasers, ultraviolet, or infrared light.
- Objects that puncture.

- Make sure employees exposed to hazards from flying objects have eye protection with side protection, such as safety glasses with clip-on or slide-on side shields.

- Make sure eye protection for employees who wear prescription lenses:

- Incorporates the prescription into the design of the eye protection; or
- Is large enough to be worn over the prescription lenses without disturbing them.

- Make sure PPE used to protect the eyes and face meet the following specific ANSI (American National Standards Institute) standards. Most commercially available PPE is marked with the specific ANSI requirements.

- PPE bought before February 20, 1995, must meet ANSI standard Z87.1-1968.

- PPE bought on or after February 20, 1995, must meet ANSI standard Z87.1-1989.

- If you use eye or face protection that does not meet these ANSI standards, you must show they are equally effective.

Note: ANSI is the American National Standards Institute that publishes nationally recognized safety and health requirements. Their address is:  
ANSI (American National Standards Institute)  
1819 L Street NW  
Washington, DC 20036  
Phone: (202) 293-8020  
Fax: (202) 293-9287  
<http://www.ansi.org>

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-16050, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-16050, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-16050, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16055 Make sure your employees use appropriate head protection.** You must:

(1) Make sure employees wear appropriate protective helmets.

- Where employees are exposed to hazards that could cause a head injury. Examples of this type of hazard include:
  - Flying or propelled objects.
  - Falling objects or materials.

- Where employees are working around or under scaffolds or other overhead structures.

- That helmets meet the following specific ANSI standards (most commercially available PPE is marked with specific ANSI requirements):

- Protective helmets bought before February 20, 1995, must meet ANSI standard Z89.1-1969.

- Protective helmets bought after February 20, 1995, must meet ANSI standard Z89.1-1986.

- If you use protective helmets that do not meet these ANSI standards, you must show they are equally effective.

(2) Make sure employees working near exposed electrical conductors that could contact their head wear a protective helmet designed (that meet the above ANSI standards) to reduce electrical shock hazard.

- Caps with metal buttons or metal visors must **not** be worn around electrical hazards.

(3) Make sure employees working around machinery or in locations that present a hair-catching or fire hazard wear caps or head coverings that completely cover their hair.

- Employees must wear a hair net that controls all loose ends when:

- Hair is as long as the radius of pressure rolls with exposed in-running nip points.

- Hair is twice as long as the circumference of exposed revolving shafts or tools in fixed machines.

- Employees must wear a hair covering of solid material when:

- The employee is exposed to an ignition source and may run into an area containing class-1 flammable liquids, such as ether, benzene, or combustible atmospheres if their hair is on fire.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16055, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16060 Make sure your employees use appropriate foot protection.** You must:

(1) Use appropriate foot protection.

- Where employees are exposed to hazards that could injure their feet. Examples of these hazards are:

- Falling objects

- Rolling objects

- Piercing/cutting injuries

- Electrical hazards

- That meets specific ANSI requirements. (Most commercially available PPE is marked with specific ANSI requirements.)

- PPE bought before February 20, 1995, must meet ANSI standard Z41.1-1967.

- PPE bought after February 20, 1995, must meet ANSI standard Z41-1991.

- If you use foot protection that does not meet these ANSI standards, you must show it is equally effective.

(2) Make sure your employees wear calks or other suitable footwear to protect against slipping while they are working on top of logs.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16060, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16065 Make sure your employees use appropriate hand protection.** You must:

- Make sure employees exposed to hazards that could injure their hands use appropriate hand protection. Examples of these hazards include:

- Absorbing harmful substances

- Severe cuts, lacerations or abrasions

- Punctures

- Chemical burns and/or thermal burns

- Harmful temperature extremes

- Make sure when choosing hand protection, you consider how well the hand protection performs relative to the:

- Task

- Conditions present

- Duration of use

- Hazards

- Potential hazards

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-16065, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-16070 Make sure your employees are protected from drowning.** You must:

(1) Provide and make sure your employees wear personal flotation devices (PFD).

- When they work in areas where the danger of drowning exists, such as:

- On the water.

- Over the water.

- Alongside the water.

Note: Employees are not exposed to the danger of drowning when:

- Employees are working behind standard height and strength guardrails.

- Employees are working inside operating cabs or stations that eliminate the possibility of accidentally falling into the water.

- Employees are wearing an approved safety belt with a lifeline attached that prevents the possibility of accidentally falling into the water.

You must:

- Provide your employees with PFDs approved by the United States Coast Guard for use on commercial or merchant vessels. The following are appropriate or allowable United States Coast Guard-approved PFDs:

Type of PFD	General Description
Type I	Off-shore life jacket - effective for all waters or where rescue may be delayed.
Type II	Near-shore buoyant vest - intended for calm, inland water or where there is a good chance of quick rescue.
Type III	Flotation aid - good for calm, inland water, or where there is a good chance of rescue.
Type V	Flotation aids such as board-sailing vests, deck suits, work vests and inflatable PFDs marked for commercial use.

- Note:
- Commercially available PFDs are marked or imprinted with the type of PFD.
  - Type IV PFDs are throwable devices. They are used to aid persons who have fallen into the water.

You must:

- Inspect PFDs before and after each use for defects and make sure that defective PFDs are not used.

(2) Provide approved life rings with an attached line on all docks, walkways, and fixed installations on or adjacent to water more than five feet deep.

- Life rings must:

- Be United States Coast Guard approved 30 inch size.
- Have attached lines that are at least 90 feet in length.
- Have attached lines at least 1/4 inch in diameter.
- Have attached lines with a minimum breaking strength of 500 pounds.

- Be spaced no more than 200 feet apart.
- Be kept in easily visible and readily accessible locations.

- Life rings and attached lines must:

- Be maintained to retain at least 75 percent of their designed buoyancy and strength.

- Be provided in the immediate vicinity when employees are assigned work at other casual locations where the risk of drowning exists.

- Work assigned over water where the vertical drop from an accidental fall would be more than 50 feet, must be subject to specific procedures as approved by the department.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-16070, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-16070, filed 5/9/01, effective 9/1/01.]

**EMPLOYER—CHEMICAL HAZARD COMMUNICATION INTRODUCTION**

**WAC 296-800-170 Employer chemical hazard communication—Introduction.**

**IMPORTANT:**

Thousands of chemicals can be found in today's workplaces. These chemicals may have the capacity to cause health problems, from minor skin irritations to serious injuries or diseases like cancer. You should review the type of chemicals you use and consider using less hazardous chemicals (such as less toxic and nonflammable chemicals).

The Employer Chemical Hazard Communication rule was developed to make sure employers and employees are informed about chemical hazards in the workplace.

This rule applies to:

- Employers engaged in businesses where chemicals are used, distributed, or produced for use or distribution.
- Contractors or subcontractors that work for employers engaged in businesses where chemicals are used, distributed, or produced for use or distribution.

**Exemptions:** • Certain products, chemicals, or items are exempt from this rule. Below is a summarized list of these exemptions. See WAC 296-800-17055 at the end of this rule to get complete information about these exemptions:

- Any hazardous waste or substance
- Tobacco or tobacco products
- Wood or wood products that are not chemically treated and will not be processed, for example, by sawing and sanding
- Food or alcoholic beverages

- Some drugs, such as retail or prescription medications
  - Retail cosmetics
  - Ionizing and nonionizing radiation
  - Biological hazards
  - Any consumer product or hazardous substance when workplace exposure is the same as that of a consumer
  - ◆ Retail products used in offices in the same manner and frequency used by consumers can be termed "consumer products," and include things such as: Correction fluid, glass cleaner, and dishwashing liquid.
- Example: If you use a household cleaner in your workplace in the same manner and frequency that a consumer would use it when cleaning their house, your exposure should be the same as the consumer's, you are exempt. A janitor using a household cleaner, such as bleach, throughout the day, is not considered to be a consumer, and is not exempt.
- Manufactured items that remain intact are exempt from this rule.
  - Manufactured items that are fluids or in the form of particles are not exempt from this rule.

The following are examples:

Item	Covered by this rule	Not covered by this rule
Brick	Sawed or cut in half	Used whole or intact
Pipe	Cut by a torch	Bent with a tube bender
Nylon Rope	Burning the ends	Tying a knot

**Reference:**

- If you produce, import, distribute and/or repackage chemicals, or choose not to rely on labels or material safety data sheets provided by the manufacturer or importer, you must comply with chemical hazard communication for manufacturers, importers and distributors, WAC 296-62-054.
- You may withhold trade secret information under certain circumstances. See trade secrets, WAC 296-62-053, to find out what information may be withheld as a trade secret and what information must be released.

**Your responsibility:**

To inform and train your employees about the hazards of chemicals they may be exposed to during normal working conditions, or in foreseeable emergencies by:

- Making a list of the hazardous chemicals present in your workplace
- Preparing a written Chemical Hazard Communication Program for your workplace
- Informing your employees about this rule and your program
- Providing training to your employees about working in the presence of hazardous chemicals
- Getting and keeping the material safety data sheets (MSDSs) for the hazardous chemicals
- Making sure that labels on containers of hazardous chemicals are in place and easy to read.

**You must:**

Develop, implement, maintain, and make available a written Chemical Hazard Communication Program.

*WAC 296-800-17005.*

Include multiemployer workplaces in your program if necessary.

*WAC 296-800-17007.*

Identify and list all the hazardous chemicals present in your workplace.

*WAC 296-800-17010.*

Obtain and maintain material safety data sheets (MSDS) for each hazardous chemical used.

*WAC 296-800-17015.*

Make sure that material safety data sheets (MSDS) are readily accessible to your employees and NIOSH.

*WAC 296-800-17020.*

Label containers holding hazardous chemicals.

*WAC 296-800-17025.*

Inform and train your employees about hazardous chemicals in your workplace.

*WAC 296-800-17030.*

Follow these rules for laboratories using hazardous chemicals.

*WAC 296-800-17035.*

Follow these rules for handling chemicals in factory sealed containers.

*WAC 296-800-17040.*

The department must:

Translate certain chemical hazard communication documents upon request.

*WAC 296-800-17045.*

Attempt to obtain a material safety data sheet (MSDS) upon request.

*WAC 296-800-17050.*

Exemption:

Items or chemicals exempt from the rule, and exemptions from labeling.

*WAC 296-800-17055.*

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-170, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-170, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-170, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-170, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17005 Develop, implement, maintain, and make available a written Chemical Hazard Communication Program.**

#### **You must:**

- Develop, implement, maintain, and make available a written Chemical Hazard Communication Program specific to your workplace. The Chemical Hazard Communication Program must, at a minimum, include:

- A list of hazardous chemicals known to be present in your workplace.

- Procedures for making sure all containers are properly labeled.

- A description of how you are going to obtain and maintain your material safety data sheets (MSDSs).

- A description of how you are going to train and inform your employees about hazardous chemicals in their workplace.

- A description of how you are going to inform your employees about:

- ◆ Chemical hazards used during nonroutine tasks.

- ◆ The hazards associated with chemicals contained in unlabeled pipes in employee work areas.

#### **You must:**

- Make your Chemical Hazard Communication Program available to your employees.

**Note:** • You must make the written Chemical Hazard Communication Program available, upon request, to employees, their designated representatives, the department and NIOSH, in

accordance with the requirements of chapter 296-802 WAC, Employee medical and exposure records.

- Where employees must travel between workplaces during a workshift, that is, if their work is carried out at more than one geographical location, the written Chemical Hazard Communication Program may be kept at the primary workplace facility.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-800-17005, filed 4/27/04, effective 8/1/04; 03-18-090, § 296-800-17005, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-17005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17005, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17007 Include multiemployer workplaces in your program if necessary.**

#### **IMPORTANT:**

- Sharing chemical hazard information at multiemployer workplaces is required for the success of your hazard communication program and the success of other employers' programs.

- This section applies to a site where you or your employees work if:

- Your employees may be exposed to hazardous chemicals used by another employer;

#### **OR**

- Another employer's employees may be exposed to hazardous chemicals you or your employees use.

Examples include employees of construction companies, cleaning services, or maintenance contractors visiting or working on-site.

#### **You must:**

- Include, in your written Chemical Hazard Communication Program, the methods you will use to share the following hazard information with other employers when their employees share a workplace with you and are potentially exposed to chemicals you produce, use, or store:

- How you will provide other employers with a copy of the relevant material safety data sheets (MSDSs), or provide access to the MSDSs in a specified location.

- How you will inform the other employers of any precautionary measures needed to protect employees during normal operating conditions and in foreseeable emergencies.

- A description of how you will inform other employers of the labeling system you use.

**Note:** You may rely on another employer's Chemical Hazard Communication Program to share the information required if the program meets the requirements of this rule.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-17007, filed 9/2/03, effective 11/1/03.]

### **WAC 296-800-17010 Identify and list all the hazardous chemicals present in your workplace.** You must:

- Identify all hazardous chemicals at your workplace.

- This includes any chemical that is known to be present in your workplace in such a way that employees may be exposed to it under normal conditions of use or in a foreseeable emergency.

- Create a list of these chemicals using the chemical or common name on the material safety data sheet (MSDS).

This list:

- Must be compiled for the workplace as a whole, or for individual work areas.

– Is necessary to make sure that all hazardous chemicals are identified and that MSDS, and labeling rules are met.

– Must be current.

**Note:** The following are some ways to determine whether a product is hazardous:

- Look for words on the label, such as "CAUTION," "WARNING," or "DANGER."
- Look for words or "hazard coding" that indicate that the chemical is flammable, an irritant, corrosive, carcinogenic, etc. "Hazard coding" refers to words, numbers, or colors that tell you a chemical is dangerous.
- Check the product's MSDS for hazard information.

Examples of hazardous chemicals are: Acids, adhesives, caustics, fuels, paints, varnishes, shellacs and pesticides. Too many other classes of hazardous chemicals exist to list them all here. If you have any questions about a chemical you have at your workplace, contact your local L&I office (see the resource section of this book).

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-17010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17010, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17015 Obtain and maintain material safety data sheets (MSDSs) for each hazardous chemical used.**

**Note:** MSDSs are a type of employee exposure record. Therefore, you must comply with the material safety data sheets (MSDSs) as exposure records, WAC 296-800-180, located in this book.

#### **You must:**

• Obtain a MSDS for each hazardous chemical used as soon as possible if the MSDS is not provided with the shipment of a hazardous chemical, from the chemical manufacturer or importer.

**Note:**

- To obtain a MSDS, you may try calling the manufacturer or checking their web site.
- If you have a commercial account with a retailer or wholesaler, you have the right to request and receive a MSDS about hazardous chemicals you purchase.
- If a chemical is purchased from a retailer with no commercial accounts, you have the right to request and receive the manufacturer's name and address so that you can contact them and request a MSDS for the chemical.
- Whoever prepares the MSDS is required to mark all blocks on the form, even if there is no relevant information for that section.
- If you have problems getting a MSDS within 30 calendar days after making a written request to the chemical manufacturer, importer, or distributor, you can get help from WISHA. You may contact your local regional office for assistance or make a written request for assistance to the:

Department of Labor and Industries  
Right-to-Know Program  
P.O. Box 44610  
Olympia, Washington 98504-4610.

Include in your request:

- A copy of the purchaser's written request to the chemical manufacturer, importer, or distributor.
- The name of the product suspected of containing a hazardous chemical.
- The identification number of the product, if available.
- A copy of the product label, if available.
- The name and address of the chemical manufacturer, importer, or distributor from whom the product was obtained.

#### **You must:**

• Maintain a MSDS for each hazardous chemical:  
– Keep copies of the required MSDSs for each hazardous chemical present in your workplace.  
– Each MSDS must be in English. You may also keep copies in other languages.

(2007 Ed.)

**Reference:** See material safety data sheets and label preparation, chapter 296-839 WAC, if you choose to create your own MSDS or label.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-17015, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-17015, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17015, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17020 Make sure material safety data sheets (MSDSs) are readily accessible to your employees and NIOSH.**

#### **You must:**

• Make sure that MSDSs are readily accessible, easily obtained without delay during each work shift by employees when they are in their work area(s).

• Make sure that employees, who must travel between workplaces during a work shift, such as when their work is carried out at more than one geographical location, can immediately obtain the required MSDS information in an emergency. (MSDSs may be kept at a central location at the primary workplace facility and accessed by means such as voice communication or laptop computer.)

**Note:**

- Electronic access (such as computer or fax), microfiche, and other alternatives to maintaining paper copies of the MSDSs are permitted as long as they do not create barriers to immediate employee access in each workplace.
- Barriers to immediate access of electronic MSDSs may include:

- Power outages
- Equipment failure
- System delays
- Deficient user knowledge to operate equipment
- Location of equipment outside the work area.

Solutions to eliminating these and other possible barriers to access may require the availability of back-up systems, employee training, and providing access equipment in the work areas.

#### **You must:**

• Make MSDSs readily available, when requested, to representatives of the National Institute for Occupational Safety and Health (NIOSH).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-18-090, § 296-800-17020, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-17020, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-17020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17020, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17025 Label containers holding hazardous chemicals.**

**Exemptions:**

- The following is a summary of items that are exempt from this rule:

- Pesticides, when labeled as required by the Environmental Protection Agency (EPA).
- Food, food additives, color additives, drugs, cosmetics, or medical/veterinary devices or products.
- Alcoholic beverages not intended for industrial use.
- Consumer products labeled as required by the Consumer Product Safety Commission.
- Agriculture or vegetable seeds treated and labeled as required by the Federal Seed Act.

For complete information about each of these, see WAC 296-800-17055.

**Note:** You are not required to label portable containers into which hazardous chemicals are transferred from labeled containers, if the chemical is used and controlled by the same employee who performed the transfer within the same shift.

**You must:**

• Make sure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked with the following information:

- The identity of the hazardous chemical(s) using either the chemical or common name.
- Appropriate hazard warnings which give general information about the relevant health and physical hazards of the chemicals. This includes health effects information, such as information about organs most likely to be affected by the chemicals.
- For individual stationary process containers, you may use alternate labeling methods such as:

- ◆ Signs
- ◆ Placards
- ◆ Process sheets
- ◆ Batch tickets
- ◆ Operating procedures or
- ◆ Other such written materials,

as long as the alternate method identifies the containers and conveys the required label information.

- Note:
- You do not need to put on new labels if existing labels already provide the required information.
  - You are not required to list each component in a hazardous mixture on the label. If a mixture is referred to on an MSDS by a product name, then the product name should be used as the identifier.
  - You may use words, pictures, symbols, or any combination of these, to communicate the hazards of the chemical.

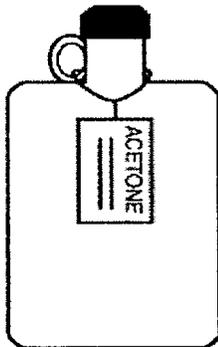
#### Sample Container Labels



- Be sure to train your employees so they can demonstrate a knowledge of the labeling system you use.
- Some alternative labeling systems do not communicate target organ information, so the employee will have to rely on training provided by the employer to obtain this information.

You must:

- Not remove or deface existing labels on incoming containers of hazardous chemicals unless the container is immediately labeled with the required information.



This is an example of a labeled container. You may use a laminated or coated label, affixed to the container with a wire, to avoid deterioration of labels due to a solvent, such as acetone.

You must:

[Title 296 WAC—p. 2704]

• Make sure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift.

Note: Employers with non-English speaking employees may use other languages in the warning information in addition to the English language.

• Make sure if the hazardous chemical is regulated by WISHA or OSHA in a substance-specific health rule, that the labels or other warnings are used according to those rules.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-17025, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-17025, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17025, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-17030 Inform and train your employees about hazardous chemicals in your workplace.** You must:

• Provide employees with effective information on hazardous chemicals in their work area at the time of their initial job assignment. Whenever a new physical or health hazard related to chemical exposure is introduced into their employees' work areas, information must be provided.

– Inform employees of:

◆ The requirements of this rule

◆ Any operations in their work area where hazardous chemicals are present

◆ The location and availability of your written Chemical Hazard Communication Program, including the list(s) of hazardous chemicals and material safety data sheets (MSDSs) required by this rule.

• Provide employees with effective training about hazardous chemicals in their work area at the time of their initial job assignment. Whenever a new physical or health hazard related to chemical exposure is introduced, the employees must be trained.

• Make sure employee training includes:

– Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area. Examples of these methods and observations may include:

◆ Monitoring conducted by you

◆ Continuous monitoring devices

◆ Visual appearance or odor of hazardous chemicals when being released

– Physical and health hazards of the chemicals in the work area, including the likely physical symptoms or effects of overexposure

– Steps employees can take to protect themselves from the chemical hazards in your workplace, including specific procedures implemented by you to protect employees from exposure to hazardous chemicals. Specific procedures may include:

◆ Appropriate work practices

◆ Engineering controls

◆ Emergency procedures

◆ Personal protective equipment to be used

– Details of the chemical hazard communication program developed by you, including an explanation of the labeling system and the MSDS, and how employees can obtain and use the appropriate hazard information.

- Tailor information and training to the types of hazards to which employees will be exposed. The information and training may be designed to cover categories of hazards, such as flammability or cancer-causing potential, or it may address specific chemicals. Chemical-specific information must always be available through labels and MSDSs

- Make reasonable efforts to post notices in your employees' native languages (as provided by the department) if those employees have trouble communicating in English.

Note:

- Interactive computer-based training or training videos can be used provided they are effective.
- Your MSDSs may not have WISHA permissible exposure limits (PELs) listed. In some cases, WISHA PELs are stricter than the OSHA PELs and other exposure limits listed on the MSDSs you receive. If this is the case, you must refer to the WISHA PEL table, WAC 296-62-075, for the appropriate exposure limits to be covered during training.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-17030, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-17030, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17030, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17035 Follow these rules for laboratories using hazardous chemicals.**

Note:

- Laboratories are required to have a written chemical hygiene plan under chapter 296-828 WAC, if applicable. They are **not** required to have a written Chemical Hazard Communication Program.
- You may combine your accident prevention program and chemical hazard communication program to assist you in developing a chemical hygiene plan for your laboratory.

You must:

(1) Make sure that labels on incoming containers of hazardous chemicals are in place and readable.

(2) Maintain material safety data sheets (MSDSs) received with incoming shipments of hazardous chemicals and make them readily accessible to laboratory employees when they are in their work areas.

(3) Provide laboratory employees with information and training as described in: "Inform and train your employees about hazardous chemicals in your workplace," WAC 296-800-17030. You do not have to cover the location and the availability of the Hazard Communication Program.

Note: Laboratory employers that ship hazardous chemicals are considered to be either chemical manufacturers or distributors. When laboratory employers ship hazardous chemicals they must comply with the rule, "hazard communication standards for chemical manufacturers, importers and distributors," WAC 296-62-054.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-800-17035, filed 1/3/06, effective 4/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-17035, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17035, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17040 Follow these rules for handling chemicals in factory-sealed containers.** This applies to situations where employees only handle chemicals in factory-sealed containers that are not opened under normal use (such as those found in marine cargo handling, trucking, warehousing, or retail sales).

You must:

(1) Make sure that labels on incoming containers of hazardous chemicals are in place and readable.

(2) Keep or obtain material safety data sheets (MSDSs).

(2007 Ed.)

- Keep any MSDSs that are received with incoming shipments of the sealed containers of hazardous chemicals.

- If a factory-sealed container of hazardous chemicals comes without a MSDS, obtain one as soon as possible, if an employee requests it.

(3) Make sure that the MSDSs are readily accessible during each work shift to employees when they are in their work area(s).

(4) Inform and train your employees about hazardous chemicals in your workplace, to protect them in case of a hazardous chemical spill or leak from a factory-sealed container. You do not have to cover the location and availability of the written Chemical Hazard Communication Program.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-17040, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-17040, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17045 Translate certain chemical hazard communication documents upon request.** The department must:

- Upon receipt of a written or verbal request, prepare and make available (within available resources) to employers or the public, a translation into Cambodian, Chinese, Korean, Spanish, or Vietnamese of any of the following:

- An employer's written Chemical Hazard Communication Program.

- A material safety data sheet or

- Written materials prepared by the department to inform employees of their rights described in this rule, regarding chemical hazard communication.

Note: Written requests for translations should be directed to:  
Department of Labor and Industries  
Right-to-Know Program  
P.O. Box 44610  
Olympia, Washington 98504-4610.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-17045, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17050 Attempt to obtain a material safety data sheet (MSDS) upon request.** The department must:

- Upon receipt of an employer's written request for a material safety data sheet, attempt to obtain the MSDS from the chemical manufacturer, importer, or distributor. When the department receives the MSDS, the department must forward a copy of it to the purchaser at no cost. Small business employers will be given priority for this service.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-17050, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-17055 Items or chemicals exempt from the rule, and exemptions from labeling.**

- Listed below are the full descriptions of the items or chemicals that are exempt, or not covered, by this rule:

- Any consumer product or hazardous substance, defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substance Act (15 U.S.C. 1261 et seq.) respectively, where you can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure that is not greater

[Title 296 WAC—p. 2705]

than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.

- Any hazardous waste defined by the Hazardous Waste Management Act chapter 70.105 RCW, when subject to regulations issued under that act by the department of ecology that describes specific safety, labeling, personnel training, and other rules for the accumulation, handling and management of hazardous waste.

- Any hazardous waste defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that act by the Environmental Protection Agency.

- Any hazardous substance defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.), when the hazardous substance is the focus of remedial or removal action being conducted under CERCLA in accordance with Environmental Protection Agency regulations.

- Tobacco or tobacco products.

- Wood or wood products, including lumber that will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to the employees is the potential for flammability or combustibility. Wood or wood products that have been treated with hazardous chemicals covered by this rule, and wood that may be subsequently sawed or cut, generating dust, are not exempted.

- Articles, meaning manufactured items other than a fluid or particle that:

- ◆ Are formed to a specific shape or design during manufacture;

- ◆ Have end use function(s) dependent in whole or in part upon their shape or design during end use; and

- ◆ Under normal conditions of use, do not release more than very small quantities, for example, minute or trace amounts of a hazardous chemical such as, emissions from a marking pen or a newly varnished wood chair, and do not pose a physical hazard or health risk to employees

- Food or alcoholic beverages that are sold, used, or prepared in a retail establishment such as a grocery store, restaurant, or drinking place, and foods intended for personal consumption by employees while in the workplace.

- Any drug, defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.), when it is in solid, final form for direct administration to the patient (for example, tablets or pills); drugs that are packaged by the chemical manufacturer for sale to consumers in a retail establishment (for example, over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (for example, first-aid supplies). Aerosolized or cytotoxic drugs administered by a health care worker are not excluded.

- Cosmetics packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace.

- Ionizing and nonionizing radiation.

- Biological hazards.

- This rule does not require labeling of the following chemicals:

- Any pesticide defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that act and labeling reg-

ulations issued under that act by the Environmental Protection Agency.

- Any chemical substance or mixture defined in the Toxic Substance Control Act (15 U.S.C. 2601 et seq.), when subject to the labeling requirements of that act, and labeling requirements issued under that act by the Environmental Protection Agency.

- Any food, food additive, color additive, drug, cosmetic, or medical/veterinary device or product, including materials intended for use as ingredients in such products (for example, flavors and fragrances), are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or the Virus-Serum Toxin Act of 1913 (21 U.S.C. 151 et seq.) and regulations issued under those acts, when they are subject to the labeling requirements under those acts by either the Food and Drug Administration or the Department of Agriculture.

- Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that act, when subject to the labeling requirements of that act and labeling regulations issued under that act by the Bureau of Alcohol, Tobacco, and Firearms.

- Any consumer product or hazardous substance defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety rule or labeling requirement of those acts, or regulations issued under those acts by the Consumer Product Safety Commission.

- Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7 U.S.C. 1551 et seq.) and the labeling requirements issued under that act by the Department of Agriculture.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-17055, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-180 Material safety data sheets (MSDSs) as exposure records.** Important: Exposure records contain information about employees' exposure to toxic substances or harmful physical agents. Material safety data sheets (MSDSs) are one type of exposure record. The preservation of and access to exposure records is necessary to improve detection, treatment, and prevention of occupational diseases.

This rule supplements the chemical hazard communication rule by extending access to MSDSs, or their alternative, after employment and after the hazardous chemical is no longer used in the workplace.

Your responsibility:

To preserve and provide access to material safety data sheets (MSDSs) or their alternative as exposure records.

You must:

Preserve exposure records for at least 30 years.

*WAC 296-800-18005.*

Inform current employees of exposure records.

*WAC 296-800-18010.*

Provide access to exposure records.

*WAC 296-800-18015.*

Transfer records when ceasing to do business.

*WAC 296-800-18020.*

- Note:
- Employee medical and exposure records, chapter 296-802 WAC, requires the preservation and access to other exposure records including records such as workplace monitoring data and biological monitoring results and medical records. If you keep these other types of employee exposure records or employee medical records, you must comply with these additional requirements.
  - This rule applies to every employer who maintains, makes, contracts for, or has access to MSDSs for chemicals used in their workplace.
  - The specific identity of a toxic substance may be withheld from a disclosable record if it is a verifiable trade secret. For trade secret requirements see chapter 296-816 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-800-180, filed 4/27/04, effective 8/1/04. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-180, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-180, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-18005 Preserve exposure records for at least 30 years.** You must:

- Keep material safety data sheets (MSDSs) and analysis using MSDSs for at least thirty years, including current, former, and future employers receiving transferred records. Preserve MSDSs in any form, as long as the information is not altered and is retrievable. You may keep alternative records instead of MSDSs concerning the identity of a substance. The alternative record must also be kept for thirty years and contain the following information:
  - Some record of the identity (chemical name, if known) of a substance or agent
  - Where the substance or agent was used
  - When the substance or agent was used

Note: Keeping alternative records may be less work than you think. When developing your hazard communication program's list of hazardous chemicals (WAC 296-800-17010), add the "where used" and "when used" information required by this rule.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-18005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-18010 Inform current employees of exposure records.** You must:

- Inform current employees who are, or will be exposed to a toxic chemical of:

Note: A chemical is toxic if:

- The latest printed edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS) lists the substance. This may be obtained on-line, CD-ROM, or on a computer tape.
- Testing by or known to the employer has shown positive evidence that the substance is an acute or chronic health hazard.
- A material safety data sheet (MSDS) kept by or known to the employer shows the material may be a hazard to human health.

– The existence, location, and availability of MSDSs or alternative records, and any other records covered by this rule.

– The person responsible for maintaining and providing access to records.

– Exposure records when the employee first enters into employment and then once a year thereafter.

– Existence and their rights of access to these records.

Note: Informing employees of the availability of these records may be accomplished by posting, group discussion or by individual notifications.

(2007 Ed.)

You must:

- Keep a copy of this rule and make copies available upon request to employees.
- Distribute to employees any informational materials about this rule that are made available to the employer by the department.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-18010, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-18010, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-18015 Provide access to exposure records.** You must:

- Provide access, whenever requested by an employee or their designated representative, to a relevant exposure record:
  - In a reasonable time, place, and manner.
  - Within fifteen working days. If the employer cannot meet this requirement, they must inform the requesting party of the reason for the delay and the earliest date the record will be made available.

Note

- Employee means any current, former or transferred worker.
- A relevant exposure record is an MSDS or its alternative or analysis using MSDSs or their alternative.

You must:

- Make sure labor and industries has prompt access to any exposure records and related analysis. This must be done without violation of any rights under the Constitution or the Washington Industrial Safety and Health Act that the employer chooses to exercise.

Note: Nothing in this rule is meant to prevent employees and collective bargaining agents from getting access to information beyond that is required by this rule.

You must:

- Make sure that whenever an employee or designated representative requests an initial copy of an exposure record, related analysis or new information added to the record:
  - A copy of the record is provided without cost to the employee or their representative or
  - The facilities are made available for copying without cost to the employee or their representative or
  - The record is loaned to the employee or their representative for a reasonable time to enable a copy to be made.

Note: Whenever a record has been previously provided without cost to an employee or designated representative, and they request additional copies, the employer may charge reasonable, non-discriminatory administrative costs (e.g., search and copying expenses, but no overhead expenses).

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-18015, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-18015, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-18015, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-18020 Transfer records when ceasing to do business.** You must:

- Transfer all material safety data sheets (MSDSs) as exposure records to the successor employer, who must do the following to these records:

– Received

– Preserve

– Keep unchanged

- If there is no successor to receive and preserve the employee exposure records:

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– Notify affected current employees of their rights of access to records at least 3 months prior to the cessation of the employer's business

and

– Transfer the records to the department, if required by a specific WISHA safety and health rule.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-18020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-18020, filed 5/9/01, effective 9/1/01.]

### SAFETY BULLETIN BOARD

**WAC 296-800-190 Summary/rule.** Your responsibility: To provide a safety bulletin board.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-190, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-19005 Provide a safety bulletin board in your workplace.** You must:

• Install and maintain a safety bulletin board in every fixed workplace (establishment) that has eight or more employees. Make sure the safety bulletin board is large enough to post information such as the following:

- Safety bulletins
- Safety newsletters
- Safety posters
- Accident statistics
- Other safety educational material.

Note: You may want to post your emergency phone numbers on the safety bulletin board.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-19005, filed 5/9/01, effective 9/1/01.]

### WISHA POSTER

**WAC 296-800-200 WISHA poster.** Your responsibility: To post the WISHA poster, which informs your employees of their job safety and health protection rights.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-200, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-20005 Post and keep a WISHA poster in your workplace.** You must:

• Post it where it can easily be seen by employees and keep it in good condition.

Note: • Other programs within labor and industries may require other workplace posters. These are:

- Job safety and health protection
- AND
- Notice to employees—If a job injury occurs
- AND
- Your rights as a nonagricultural worker

• You can obtain a free copy of labor and industries posters from any labor and industries office or by printing it off our web site (<http://www.lni.wa.gov/ipub/101-054-000.htm>). You can find the labor and industries office closest to you by:

• Checking the resource section of this book for regional offices.

OR

- Calling 1-800-4BE SAFE (1-800-423-7233)

OR

- <http://www.lni.wa.gov/wisha/question.htm#contact>.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-20005, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-

800-20005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-20005, filed 5/9/01, effective 9/1/01.]

### LIGHTING

**WAC 296-800-210 Lighting.** Your responsibility: To provide and maintain adequate lighting in your workplace.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-210, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-21005 Provide and maintain adequate lighting.**

Note: This section establishes minimal levels of lighting for safety purposes only. Guidelines pertaining to optimal levels of lighting and illumination may be found in Practice for Industrial Lighting, ANSI/IES RP7-1979. (See the resource section of this book on how to contact ANSI.)

You must:

• Provide and maintain adequate lighting for all work activities in your workplace. See the following table.

Lighting Table		
Activity	Minimum acceptable average lighting level in an area: (Foot-candles)	Any one single measurement used to determine the average lighting level* cannot be less than: (Foot-candles)
Indoor task	10	5
Outdoor task	5	2.5
Nontask activities for both indoor and outdoor	3	1.5

\* Lighting levels must be measured at thirty inches above the floor/working surface at the task.

You must:

• Have adequate light for employees to see nearby objects that might be potential hazards or to see to operate emergency controls or other equipment, if general lighting is not available.

Note: • Lighting levels can be measured with a light meter.  
• Conversion information: 1 foot-candle = 1 lumen incident per square foot = 10.76 lux.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-21005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-21005, filed 5/9/01, effective 9/1/01.]

### HOUSEKEEPING, DRAINAGE, AND STORAGE

**WAC 296-800-220 Housekeeping, drainage, and storage—Summary.** Your responsibility: To provide your employees with a clean, dry, pest-free workplace.

Note: The introduction has important information about building, electrical and fire codes that may apply to you in addition to WISHA rules. See "How do the WISHA rules relate to building, fire, and electrical codes" in the introduction section of this book.

You must:

**Housekeeping**

Keep your workplace clean.

*WAC 296-800-22005.*

Sweep and clean your workplace to minimize dust.

*WAC 296-800-22010.*

Keep your workplace free of obstacles that interfere with cleaning.

*WAC 296-800-22015.*

Control pests in your workplace.

*WAC 296-800-22020.*

Make sure floors are maintained in a safe condition.

*WAC 296-800-22022.*

#### **Drainage**

Keep your workroom floors dry, when practical.

*WAC 296-800-22025.*

Provide proper drainage.

*WAC 296-800-22030.*

#### **Storage areas**

Store things safely.

*WAC 296-800-22035.*

Control vegetation in your storage areas.

*WAC 296-800-22040.*

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-220, filed 5/9/01, effective 9/1/01.]

### **HOUSEKEEPING**

#### **WAC 296-800-22005 Keep your workplace clean.**

You must:

- Keep all areas of your workplace, passageways, storage rooms, and service rooms in a clean, orderly and sanitary condition to the extent the nature of the work allows.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22005, filed 5/9/01, effective 9/1/01.]

#### **WAC 296-800-22010 Sweep and clean your workplace to minimize dust.** You must:

- Sweep and clean your workplace in a way that minimizes dust in the air as much as possible.
- When practical, clean after hours so that your employees are not exposed to dust in the air on the job.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22010, filed 5/9/01, effective 9/1/01.]

#### **WAC 296-800-22015 Keep your workplace free of obstacles that interfere with cleaning.** You must:

- Keep your workplace clear of obstructions such as nails, splinters, loose boards and unnecessary holes and openings to make cleaning easier and more effective.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22015, filed 5/9/01, effective 9/1/01.]

#### **WAC 296-800-22020 Control pests in your workplace.** You must:

- Make sure each building in your workplace is constructed, equipped and maintained so it restricts pests from entering or living in it. Pests include animals such as:
  - Rodents (rats, mice, and squirrels)
  - Birds (starlings, pigeons, and swallows)
  - Insects (bees, wasps, and mosquitoes)
- Take steps to effectively control pests in your workplace, if they are detected.
  - Carry out a continuing and effective control program in the areas of your workplace where pests have been detected.

(2007 Ed.)

- Note:
- By handling dead or live pests including their waste products, attached parasites and other contaminated materials, your employees may be exposed to certain health risks. These risks include, but are not limited to: Hanta virus, rabies, lyme disease and psittacosis. Contact your local L&I office (see resource section of this book) or the public health department for more information about health risks and proper pest handling and disposal techniques.
  - "Workplace" includes storage areas.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-22020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-22020, filed 5/9/01, effective 9/1/01.]

#### **WAC 296-800-22022 Make sure floors are maintained in a safe condition.** You must:

- Make sure floors are kept free of debris. This includes:
  - Buildings
  - Platforms
  - Walkways and driveways
  - Storage yards
  - Docks
- Use a nonslip coating on all polished floors.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22022, filed 5/9/01, effective 9/1/01.]

### **DRAINAGE**

#### **WAC 296-800-22025 Keep your workroom floors dry, when practical.** You must:

- Do the following to help keep your employees dry if wet processes are used in your work area:
  - Maintain drainage away from the work area; and
  - Provide false floors, platforms, or other dry places where employees can stand, where practical, or
  - Provide appropriate waterproof footwear.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22025, filed 5/9/01, effective 9/1/01.]

#### **WAC 296-800-22030 Provide proper drainage.** You must:

- Provide all areas where employees work, such as yards, basements, or garages, with adequate drainage.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22030, filed 5/9/01, effective 9/1/01.]

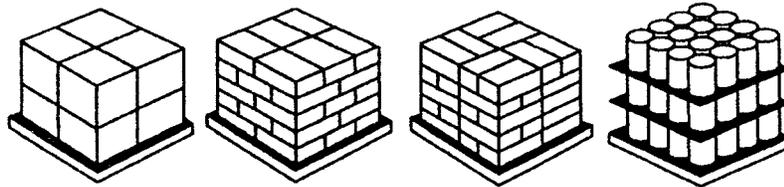
### **STORAGE AREAS**

#### **WAC 296-800-22035 Store things safely.** You must:

- Store materials so they do not create a hazard.
- Keep workplace storage areas free from accumulation of materials that could create hazards from tripping, fire, or explosion.
  - Secure stored items such as bundles, containers, and bags to prevent them from falling, sliding, or collapsing by doing one or more of the following:
    - Stacking
    - Racking
    - Blocking
    - Interlocking
    - Otherwise securing them
- Make sure stored items are limited in height so that they are stable and secure to prevent sliding or collapse.

[Title 296 WAC—p. 2709]

## Examples of Proper Material Storage



Block Pattern

Brick

Pinwheel

Rigid Spacer

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22035, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-22040 Control vegetation in your storage areas.** You must:

- Control vegetation in your storage areas when necessary to create a safe working environment.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-22040, filed 5/9/01, effective 9/1/01.]

**SANITATION AND HYGIENE FACILITIES AND PROCEDURES**

**WAC 296-800-230 Summary.**

**Your responsibility:**

To provide safe drinking (potable) water, bathrooms, washing facilities, eating areas and garbage and waste disposal in your workplace.

**You must:**

**General requirements for all workplaces.**

**Drinking water**

Provide safe drinking (potable) water in your workplace.  
*WAC 296-800-23005.*

Clearly mark water outlets that are not fit for drinking (nonpotable).

*WAC 296-800-23010.*

Make sure systems delivering not fit for drinking (non-potable) water prevent backflow into drinking water systems.

*WAC 296-800-23015.*

**Bathrooms and washing facilities**

Provide bathrooms for your employees.

*WAC 296-800-23020.*

Provide convenient, clean washing facilities.

*WAC 296-800-23025.*

**Eating areas and food service**

Make sure eating areas are safe and healthy.

*WAC 296-800-23040.*

Follow these requirements if you provide food service to your employees.

*WAC 296-800-23045.*

**Garbage and waste disposal**

Dispose of garbage and waste safely.

*WAC 296-800-23050.*

Remove garbage and waste in a way that does not create a health hazard.

*WAC 296-800-23055.*

**Lunchrooms and personal service rooms**

Provide a separate lunchroom if employees are exposed to toxic substances if they are allowed to eat and drink on the job site.

*WAC 296-800-23060.*

Provide showers when required for employees working with chemicals.

*WAC 296-800-23065.*

Provide change rooms when required.

*WAC 296-800-23070.*

Make sure any work clothes you provide are dry.

*WAC 296-800-23075.*

**Note:** Some industries may have additional rules on bathrooms and washing facilities. Some examples include:

Industry	WAC
Agriculture; indoor sanitation and temporary labor camps	chapter 296-307 WAC
Carcinogens; general regulated area requirements	WAC 296-62-07308
Charter boats	WAC 296-115-050
Compressed air work	WAC 296-36-160(5)
Construction	WAC 296-155-140
Temporary labor camps	WAC 296-24-12507

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-230, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-230, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-230, filed 5/9/01, effective 9/1/01.]

**DRINKING WATER**

**WAC 296-800-23005 Provide safe drinking (potable) water in your workplace.**

**You must:**

(1) Provide safe drinking (potable) water for employees for:

- Washing themselves
- Personal service rooms
- Cooking
- Washing premises where food is prepared or processed
- Washing food, eating utensils, or clothing

(2) Make sure when providing movable or portable drinking water dispensers that they are:

- Capable of being closed
- Kept in sanitary condition
- Equipped with a tap

(3) Prohibit employees from:

- Using shared drinking cups or utensils.
- Using open containers such as barrels, pails, and tanks that require employees to dip or pour drinking water, even if the containers have covers.

**Definition:**

• Potable water is water that you can safely drink that meets specific safety standards prescribed by the United States Environmental Protection Agency's *National Interim Primary Drinking Water Regulations*, published in 40 CFR Part 141, and 40 CFR 147.2400.

• Personal service rooms are used for activities not directly connected with a business' production or service function such as first aid, medical services, dressing, showering, bathrooms, washing and eating.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-23005, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-23005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-23005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-23010 Clearly mark the water outlets that are not fit for drinking (nonpotable).**

**You must:**

(1) Mark water outlets that are not fit for drinking (nonpotable), such as those used for industrial processes or fire fighting, so they will not be used for:

- Drinking
- Washing themselves, except in emergencies
- Cooking
- Washing food, eating utensils, or clothing.

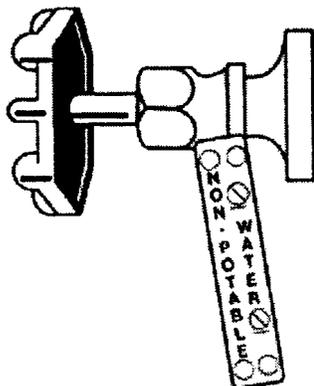
(2) Prohibit the use of nonpotable water containing substances that could create unsafe conditions such as:

- Concentrations of chemicals, such as lead or chlorine
- Fecal coliform bacteria.

**Note:** As long as the nonpotable water is free of substances that could create unsafe conditions, the water can be used for cleaning both:

- Work premises used for activities other than food preparation or processing
- AND
- Personal service rooms, such as bathrooms.

**Reference:** You may need to follow additional requirements for emergency washing facilities. See WAC 296-800-150 First aid, for more information.



**Outlets for water not fit to drink must be marked.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23010, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-23010, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-23010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-23010, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-23015 Make sure that systems delivering not-fit-for-drinking (nonpotable) water prevent backflow into drinking water systems.** You must:

- Make sure that systems delivering not-fit-for-drinking (nonpotable) water prevent backflow into drinking water systems.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-23015, filed 5/9/01, effective 9/1/01.]

**BATHROOMS AND WASHING FACILITIES**

**WAC 296-800-23020 Provide bathrooms for your employees.**

**Exemption:** You do not have to provide bathrooms: For mobile crews or at work locations not normally attended by employees, if there is transportation immediately available to nearby bathrooms that meet the requirements of this section.

**Exemption:** You do not have to provide bathrooms: For mobile crews or at work locations not normally attended by employees, if there is transportation immediately available to nearby bathrooms that meet the requirements of this section.

**You must:**

(1) Provide bathrooms with the appropriate number of toilets for your employees at every workplace based on Table 1.

- Have an appropriate number of toilets for each gender, based on the number of male and female employees at your workplace.

- For example, if you have thirty-seven men and seven-teen women, you need to have three toilets for the men and two toilets for the women, based on Table 1.

- Make sure each toilet is in a separate compartment with a door and walls or partitions for privacy.

**Table 1  
Required Number of Employee Toilets at Every Work-  
place**

Maximum Number of Employees Present at Any One Time During a Shift	Minimum Number of Toilets Required
1 to 15	1
16 to 35	2
36 to 55	3
56 to 80	4
81 to 110	5
111 to 150	6
Over 150	One additional toilet for each additional 40 employees

**Note:** A shared bathroom (multiple toilets without enclosures) counts as one toilet no matter how many toilets it contains. In bathrooms used only by men, urinals may be substituted for up to 1/3 of the required toilets.

**You must:**

(2) Provide toilet paper and a toilet paper roll holder for each toilet.

(3) Make sure bathrooms are maintained in a clean and sanitary condition.

(4) Make sure the sewage disposal method does not endanger the health of employees.

- Exemption:** Separate bathrooms for men and women are not required if the bathroom:
- Will only be occupied by one person at a time.
  - Can be locked from the inside.
  - Contains at least one toilet.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23020, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-23020, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-23020, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-23025 Provide convenient and clean washing facilities.**

- Exemption:** You do **not** have to provide washing facilities for:
- Mobile crews or work locations not normally attended by employees, if there is immediately available transportation to nearby washing facilities that meet the requirements of this rule.

**You must:**

• Provide convenient and clean washing facilities for employees including:

- Sinks or basins for personal washing
- Hot and cold water, or lukewarm (tepid), running water in each sink and basin
- Hand soap or similar cleaning agents
- One of the following:
  - Individual paper or cloth hand towels
  - Individual sections of clean continuous cloth toweling
  - Warm air blowers for drying hands, located near the sinks and basins.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23025, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-23025, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-23025, filed 5/9/01, effective 9/1/01.]

## **EATING AREAS AND FOOD SERVICE**

### **WAC 296-800-23040 Make sure eating areas are safe and healthy.**

**You must:**

(1) Make sure employees are not allowed to eat and drink in:

- Bathrooms.
- Areas exposed to toxic substances.

(2) Make sure food is not stored in bathrooms or areas exposed to toxic substances.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23040, filed 9/2/03, effective 11/1/03.]

### **WAC 296-800-23045 Follow these requirements if you provide food service to your employees.**

**You must:**

- Make sure all food service facilities and operations you make available follow sound hygiene principles.
- Make sure the food is:

– Unspoiled.

– Protected from contamination during processing, preparation, handling, and storage.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23045, filed 9/2/03, effective 11/1/03.]

## **GARBAGE AND WASTE DISPOSAL**

### **WAC 296-800-23050 Dispose of garbage and waste safely.**

**You must:**

(1) Make sure garbage containers are:

- Kept in a clean and sanitary condition.
- Made from smooth, corrosion resistant materials.
- Easily cleaned or are disposable.
- Equipped with a solid tight-fitting cover unless you can keep them in a sanitary condition without a cover.

(2) Provide enough garbage containers to make sure they:

- Are conveniently located to encourage their use.
- Won't be overfilled.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23050, filed 9/2/03, effective 11/1/03.]

### **WAC 296-800-23055 Remove garbage and waste in a way that does not create a health hazard.**

**You must:**

• Remove all sweepings, solid and liquid wastes, refuse, and garbage as often as needed to keep the workplace in a sanitary condition.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23055, filed 9/2/03, effective 11/1/03.]

## **LUNCHROOMS AND PERSONAL SERVICE ROOMS**

### **WAC 296-800-23060 Provide a separate lunchroom if employees are exposed to toxic substances if they are allowed to eat and drink on the job site.**

**You must:**

(1) Provide a lunchroom separate from the work area if employees are exposed to toxic substances.

(2) Use Table 2 to determine the required square footage in your lunchroom based on the number of employees using the room at any one time.

**Table 2**  
**Maximum Number of Employees Using Lunchroom at One Time**

<b>Number of Persons</b>	<b>Square Feet per Person</b>
25 and less	13
26-74	12
75-149	11
150 and over	10

**Note:** You do not have to provide a separate lunchroom if it is convenient for employees to leave the workplace to eat and drink.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23060, filed 9/2/03, effective 11/1/03.]

**WAC 296-800-23065 Provide showers when required for employees working with chemicals.**

**You must:**

- Provide showers for employees if:
  - They work with chemicals that could cause an occupational illness;

**AND**

- The chemicals remain on the skin between work shifts.
  - Make sure employees who work with such chemicals shower at the end of their shifts.
    - Make sure showers have:
      - Soap or other cleansing agents.
      - Hot and cold water with a common discharge line.
        - Provide individual, clean towels for each employee who is required to shower.
          - Provide at least one shower for every ten employees (or every fraction of 10) of each gender.

**Note:** Table 3 shows the number of showers to provide based on a "fraction of 10."

**Table 3**

Number of Employees of Each Gender	Number of Showers
1-10	1
11-20	2
21-30	3
31-40	4
41-50	5

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23065, filed 9/2/03, effective 11/1/03.]

**WAC 296-800-23070 Provide change rooms when required.**

**You must:**

- Provide change rooms when employees are required by a particular standard to wear protective clothing because of the possibility of contamination with toxic materials.
  - Make sure change rooms have separate storage facilities for street clothes and protective clothing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23070, filed 9/2/03, effective 11/1/03.]

**WAC 296-800-23075 Make sure any work clothes you provide are dry.**

**You must:**

- Make sure when providing work clothes to employees that the clothing provided is dry if the clothing:
  - Gets wet during use;

**OR**

- Is washed before it is reused.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-23075, filed 9/2/03, effective 11/1/03.]

**ENVIRONMENTAL TOBACCO SMOKE IN THE OFFICE**

**WAC 296-800-240 Summary.** Your responsibility: To eliminate exposure to *environmental tobacco smoke* in your *office work environment*.

**You must:**

- Prohibit tobacco smoke in your office work environment *WAC 296-800-24005*.

(2007 Ed.)

**Note:** This rule does not preempt any federal, state, municipal, or other local authority's regulation of indoor smoking that is more protective than this section.

**Definition:** Office work environment is an indoor or enclosed occupied space where clerical work, administration, or business is carried out. In addition, it includes:

- Other workplace spaces controlled by the employer and used by office workers, such as cafeterias, meeting rooms, and washrooms.
- Office areas of manufacturing and production facilities, not including process areas.
- Office areas of businesses such as food and beverage establishments, agricultural operations, construction, commercial trade, services, etc.

**Link:** For work environments outside the office, contact your local health department using the link <http://www.seconddhandsmokesyou.com> or by calling them directly.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-22-023, § 296-800-240, filed 10/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-240, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-24005 Prohibit tobacco smoke in your office work environment.** Exemption: The minimum criteria specified in this rule do not apply to outdoor structures provided for smokers such as gazebos or lean-tos that maintain the twenty-five feet distance from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

**You must:**

- (1) Prohibit *smoking* in your office work environment
- (2) Use administrative controls to prevent tobacco smoke from entering your office from outside the building.
  - Make sure that outside smoking areas used by your employees are at least twenty-five feet from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-22-023, § 296-800-24005, filed 10/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-24005, filed 5/9/01, effective 9/1/01.]

**STAIRS AND STAIR RAILINGS SUMMARY**

**WAC 296-800-250 Summary.** Your responsibility: To make sure stairs used by employees are safe

**You must:**

- Provide fixed stairs where required *WAC 296-800-25005*
- Provide stairs that minimize hazards *WAC 296-800-25010*
- Provide handrails and stair railings *WAC 296-800-25015*.

**Exemptions:** This rule does **not** apply to:

- ◆ Stairs used exclusively for fire exit purposes
- ◆ Construction operations (See WAC 296-24-76503 for the specifications for the safe design and construction of fixed general industrial stairs.)
- ◆ Private buildings or residences
- ◆ Articulated stairs (for example, stairs used at a marina)
- ◆ Nonindustrial and monumental stairs are excluded as they are not industrial stairs; however, when public and private building steps are located at loading or receiving docks, in maintenance areas, etc., or are used exclusively by employees, the requirements of this rule must apply.

**Note:** The introduction has important information about building, electrical and fire codes that may apply to you in addition to WISHA rules. See "How do the WISHA rules relate to building, fire, and electrical codes" in the introduction section of this book.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-250, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-250, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-25005 Provide fixed stairs where required.** You must:

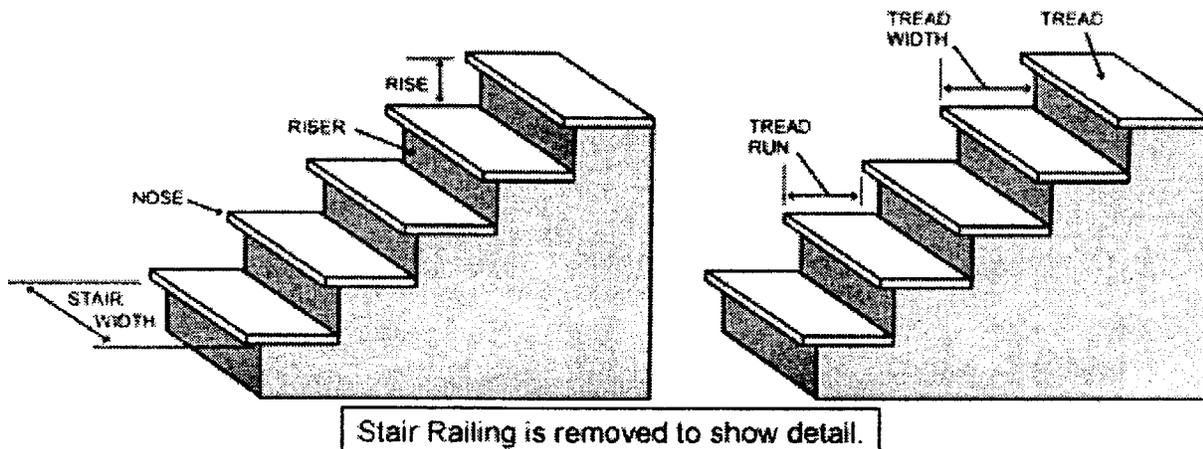
- Install fixed stairs where:
  - Employees travel between different levels on a predictable and regular basis.
  - Access to platforms is required to give routine attention to equipment under operation.
  - Daily movement between elevations is required to gauge, inspect, and maintain equipment where those work assignments may expose employees to acids, caustics, gases, or other harmful substances.
  - Carrying tools or equipment by hand is a normal work requirement.

- Not use spiral stairways except as secondary exit routes.

- Note:
- You can use fixed ladders for climbing elevated structures, such as tanks, towers, and overhead traveling cranes, when their use is common practice in your industry.
  - You can use winding stairways on tanks and similar round structures if the structure's diameter is at least five feet.
  - You could use a spiral stairway as an exit route in a restricted area that lacks room for a conventional stairway.

- Definitions:
- A stairway or fixed stairs is a series of steps and landings:
    - Leading from one level or floor to another.
    - Leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment.
    - Used more or less continuously or routinely by employees or only occasionally by specific individuals.
    - With three or more risers.
  - A riser is the vertical part of the step at the back of a tread that rises to the front of the tread above.
  - A tread is the horizontal part of the step. Tread width is the distance from the front of the tread to the back.

Stair Components



[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-25005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-25005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-25010 Provide stairs that minimize hazards.** You must:

- (1) Make sure stairs have slip-resistant treads.
- (2) Make sure that stairs with four or more risers have:
  - Railings on the open sides of all exposed stairways and stair platforms
  - Handrails on at least one side of closed stairways, preferably on the right side while descending
- (3) Provide a platform where doors or gates open directly on a stairway. The swing of the door must not reduce the effective width of the platform to less than 20 inches.

Note: To see all of the rules for building fixed stairs, refer to WAC 296-24-75011 and 296-24-765 of the General safety and health standard.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-25010, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-25015 Provide handrails and stair railings.**

Exemption: Vehicle service pit stairways are exempt from the rules for stairway railing and guards, if they would prevent a vehicle from moving into a position over the pit.

- Definition:
- A handrail is a single bar or pipe on brackets from a wall or partition to provide a continuous handhold for persons using a stair.
  - A stair railing is a vertical barrier attached to a stairway with an open side, to prevent falls. The top surface of the stair railing is used as a handrail.

You must:

- Make sure stairways less than forty-four inches wide have:
  - At least one handrail, preferably on your right side as you go down the stairs, if both sides are enclosed.
  - OR
  - At least one stair railing on the open side, if one side is open.
  - OR
  - One stair railing on each side, if both sides are open.
- Make sure stairways more than forty-four inches wide but less than eighty-eight inches wide have:
  - One handrail on each enclosed side.
  - One stair railing on each open side.
- Make sure stairways at least eighty-eight inches wide have:
  - One handrail on each enclosed side.

- One stair railing on each open side.
- One intermediate stair railing located approximately midway of the width.
- Equip winding stairs with a handrail, offset to prevent walking on all portions of the treads, less than six inches wide.

Reference: Railings must consist of a top rail, intermediate rail, and posts. To see all of the rules for building handrails and stairway railings, refer to WAC 296-24-75011, of the general safety and health standard.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-25015, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-25015, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-25015, filed 5/9/01, effective 9/1/01.]

**FLOOR OPENINGS, FLOOR HOLES AND OPEN-SIDED FLOORS**

**WAC 296-800-260 Summary.** Your responsibility: To safely guard floor openings, floor holes, and open-sided floors in your workplace.

You must:

Guard or cover floor openings and floor holes.

*WAC 296-800-26005.*

Protect open-sided floors and platforms.

*WAC 296-800-26010.*

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-260, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-26005 Guard or cover floor openings and floor holes.**

Definition: A **floor opening** is an opening in any floor, platform, pavement, or yard that measures at least twelve inches in its smallest dimension and through which a person can fall.

Examples of floor openings are:

- Hatchways
- Stair or ladder openings
- Pits
- Large manholes.

The following are **not** considered **floor openings**:

- Openings occupied by elevators
- Dumbwaiters
- Conveyors
- Machinery
- Containers

A **floor hole** is an opening in any floor, platform, pavement, or yard that measures at least one inch but less than twelve inches at its smallest dimension and through which materials and tools (but not people) can fall.

Examples of floor holes are:

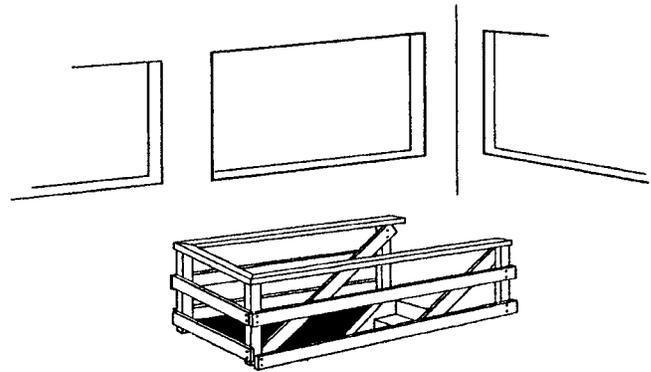
- Belt holes
- Pipe openings
- Slot openings

You must:

(1) Guard stairway floor openings, temporary floor openings and floor holes.

- Protect all stairway floor openings with a railing. The railing must protect all open sides except the stairway entrance side.

(2007 Ed.)



Guardrail installed around all sides of stairway opening except at the entrance.

- Use a hinged cover and a removable railing where traffic across an infrequently used stairway floor opening prevents the installation of a fixed railing. This removable railing must protect all open sides except the stairway entrance side.

- Protect temporary floor openings by either a railing or by a person who constantly attends the opening.

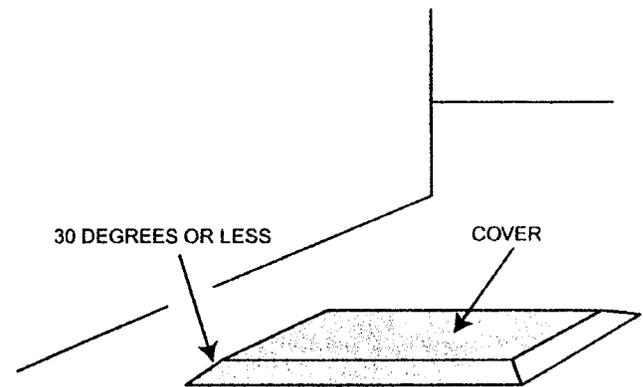
- Protect exposed floor holes into which a person can accidentally walk by either:

- A railing with a toeboard on all open sides or

- A floor hole cover of standard strength and construction that can be hinged in place. When a floor hole cover is not in place, the hole must be protected by a removable railing or constantly attended by someone.

- Provide covers for floor openings. Floor opening covers may be of any material that has a safety factor of four, or is strong enough to hold up to four times the intended load. Covers that do not project more than one inch above the floor level may be used providing all edges are beveled (slanted) to prevent tripping. All hinges, handles, bolts, or other parts of a cover must set flush with the floor or cover surface.

- Provide covers for floor openings. Floor opening covers may be of any material that has a safety factor of four, or is strong enough to hold up to four times the intended load. Covers that do not project more than one inch above the floor level may be used providing all edges are beveled (slanted) to prevent tripping. All hinges, handles, bolts, or other parts of a cover must set flush with the floor or cover surface.



A cover that projects above the surface must be beveled to reduce the tripping hazard.

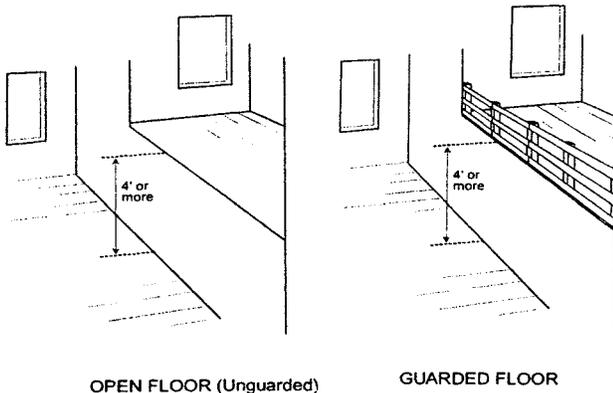
(2) Prevent tools and materials from falling through a floor hole. The floor hole must be protected by a cover that leaves an opening no more than one inch wide and is securely held in place. This applies only to floor holes that persons

[Title 296 WAC—p. 2715]

cannot accidentally walk into on account of fixed machinery, equipment, or walls.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-26005, filed 5/9/01, effective 9/1/01.]

### WAC 296-800-26010 Protect open-sided floors and platforms.



You must:

(1) Guard open-sided floors and platforms.

- Guard open-sided floors and platforms four feet or more above adjacent floor or ground level by a railing. The entrance to a ramp, stairway, or fixed ladder does not need a railing.

- Guard open-sided floors, walkways and platforms above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, and other similar hazards, regardless of height with a railing and toeboard.

(2) Make sure tools and loose materials are not left on overhead platforms and scaffolds.

Note:

- Where the guarding rules above do not apply because employees exposure to falls is infrequent (not on a predictable and regular basis), you must comply with the Personal Protective Equipment (PPE) rules (WAC 296-800-160) or other effective fall protection must be provided.
- You can find the minimum requirements for standard railings of various types of construction in WAC 296-24-75011.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-26010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-26010, filed 5/9/01, effective 9/1/01.]

## WORKPLACE STRUCTURAL INTEGRITY

**WAC 296-800-270 Summary.** Your responsibility: To make sure that the buildings, floors, and other structures in your workplace are safe, well-built, and not overloaded

You must:

Not overload floors or roofs

WAC 296-800-27005.

Make sure that floors are safe

WAC 296-800-27010.

Make sure floors can support equipment that moves or has motion

WAC 296-800-27015.

Post approved load limits (weight limits) for floors

WAC 296-800-27020.

[Title 296 WAC—p. 2716]

Note: The introduction has important information about fire, building and electrical codes that may apply to you in addition to WISHA rules. See "How do the WISHA rules relate to fire, building and electrical codes" in the introduction section of this book.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-270, filed 5/9/01, effective 9/1/01.]

### WAC 296-800-27005 Do not overload floors or roofs.

You must:

- Prohibit overloading roofs and floors of any building or other structure with more weight than is approved by the building official.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-27005, filed 5/9/01, effective 9/1/01.]

### WAC 296-800-27010 Make sure that floors are safe.

You must:

- Make sure that floors including their parts and structural members are safe.

- Make sure floors are of substantial construction and kept in good repair. This includes floors of:

- Buildings
- Platforms
- Walks and driveways
- Storage yards
- Docks

- Make sure that structures are designed, constructed, and maintained to provide a safety factor of 4 times the imposed maximum strain.

- If you notice bowing, cracking, or other indications of excessive strain on a structure, you must take action to make sure it is safe.

Note: This rule applies to all buildings or those that have had complete or major changes or repairs built after 5/7/74.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-27010, filed 5/9/01, effective 9/1/01.]

### WAC 296-800-27015 Make sure floors can support equipment that moves or has motion. You must:

- Make sure flooring of buildings, ramps, docks, trestles and other fixed structures that supports equipment that moves or has motion such as vibration, must not be less than two and one-half inch material.

Note: Where flooring is covered by steel floor plates, 2-inch material may be used.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-27015, filed 5/9/01, effective 9/1/01.]

### WAC 296-800-27020 Post approved load limits (weight limits) for floors. You must:

- Post approved load limits (weight limits) for floors used for mercantile, business, industrial or storage purposes in an obvious place.

- As the owner, or owner's agent, of a building (or other part of a workplace) post the load approved by the building official by:

- Supplying and affixing a durable metal sign that is marked with the approved load.
- Placing the metal sign in an obvious spot in the space to which it applies.

(2007 Ed.)

– Replacing the metal sign if it is lost, defaced, damaged, or removed.

Note: This rule applies to the floor that supports shelving, but not to the shelves themselves.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-27020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-27020, filed 5/9/01, effective 9/1/01.]

## BASIC ELECTRICAL RULES

### **WAC 296-800-280 Basic electrical rules.** Summary.

Your responsibility: To protect your employees from hazards when working with electrical equipment, tools, and appliances.

You must:

Inspect all electrical equipment your employees use to make sure the equipment is safe.

*WAC 296-800-28005.*

Make sure all electrical equipment is used for its approved or listed purpose.

*WAC 296-800-28010.*

Make sure electrical equipment used or located in wet or damp locations is designed for such use.

*WAC 296-800-28015.*

Make sure electrical equipment that is not marked by the manufacturer cannot be used.

*WAC 296-800-28020.*

Identify disconnecting means.

*WAC 296-800-28022.*

Maintain electrical fittings, boxes, cabinets, and outlets in good condition.

*WAC 296-800-28025.*

Maintain all flexible cords and cables in good condition and use safely.

*WAC 296-800-28030.*

Guard electrical equipment to prevent your employees from electrical hazards.

*WAC 296-800-28035.*

Make sure electrical equipment is effectively grounded.

*WAC 296-800-28040.*

Make sure electrical equipment has overcurrent protection.

*WAC 296-800-28045.*

Exemptions: • These rules apply to all electrical equipment used in the workplace, except for:

– Electrical installations and equipment on ships, aircraft and all automotive vehicles other than mobile homes and recreational vehicles.

– Electrical installations and equipment used to generate, transmit, transform or distribute power exclusively for operation of rolling stock.

– Electrical installations used exclusively for signaling and communicating with rolling stock.

– Installations underground in mines.

– Installations of communication equipment located outdoors or inside buildings used and controlled exclusively by communication utilities.

– Installations controlled and used exclusively by electric utilities for communication or metering, or

For generating, controlling, transforming, transmitting and distributing electric energy in buildings used exclusively by the company located:

◆ Outdoors on property owned or leased by the utility; or

◆ On public highways, streets and roads; or

◆ Outdoors by established rights on private property.

Note: • The introduction has important information about fire, building and electrical codes that may apply to you in addition to WISHA rules. See "How do the WISHA rules relate to fire, building and electrical codes" in the introduction section of this book.

tion to WISHA rules. See "How do the WISHA rules relate to fire, building and electrical codes" in the introduction section of this book.

• These rules guide how electrical equipment is used and maintained in your workplace. They should not be used in place of your local electrical codes if you are installing electrical wiring, electrical circuits or electrical distribution equipment.

• This rule applies to 600 volts or less. Requirements for specific equipment or special installation are found in chapter 296-24 WAC, Part L.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-280, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-280, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-28005 Inspect all electrical equipment your employees use to make sure the equipment is safe.** You must:

• Inspect electrical equipment to make sure there are no recognized hazards likely to cause your employees' death or serious physical harm. Determine the safety of the equipment by using the following list:

– Has been approved or listed by a recognized testing laboratory, such as Underwriters Laboratories (UL) or other approving agency.

– Is approved, or listed as approved, for the purpose it is being used.

– Has strong and durable guards providing adequate protection including parts designed to enclose and protect other equipment.

– Is insulated.

– Will not overheat under conditions of use.

– Will not produce arcs during normal use.

– Is classified by:

◆ Type

◆ Size

◆ Voltage

◆ Current capacity

◆ Specific use

◆ Other factors

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-28005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-28005, filed 5/9/01, effective 9/1/01.]

### **WAC 296-800-28010 Make sure all electrical equipment is used for its approved or listed purpose.**

Definitions: • Electrical outlets are places on an electric circuit where power is supplied to equipment through receptacles, sockets and outlets for attachment plugs.

• Receptacles are outlets that accept a plug to supply electric power to equipment through a cord or cable.

You must:

• Make sure electrical outlets are rated equal or greater to the electrical load supplied.

• Make sure the proper mating configuration exists when connecting the attachment plug to a receptacle.

• Make sure when electrical outlets, cord connectors, and receptacles are joined, they accept the attachment plug with the same voltage or current rating.

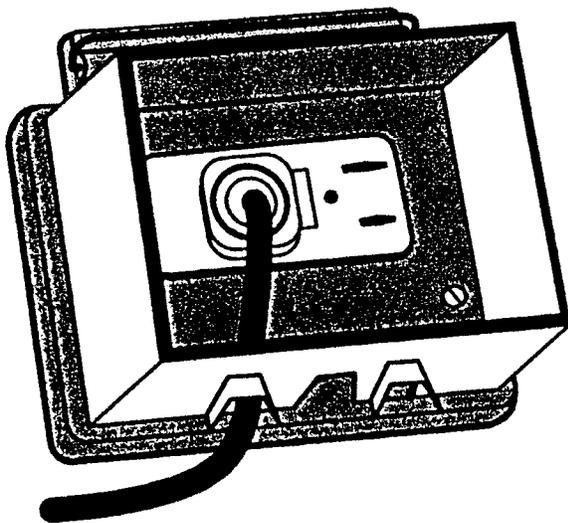
SOME COMMON ELECTRICAL OUTLET (RECEPTACLE) CONFIGURATIONS				
	15 Ampere	20 Ampere	30 Ampere	50 Ampere
Two Pole 3 - Wire Grounding 125 Volt				
Three Pole 3 - Wire 125/250 Volt				
<p><b>Note:</b> A 20-ampere "T-solt" outlet or cord connector may accept a 15-ampere attachment plug of the same voltage rating.</p>				

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-28010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-28010, filed 5/9/01, effective 9/1/01.]

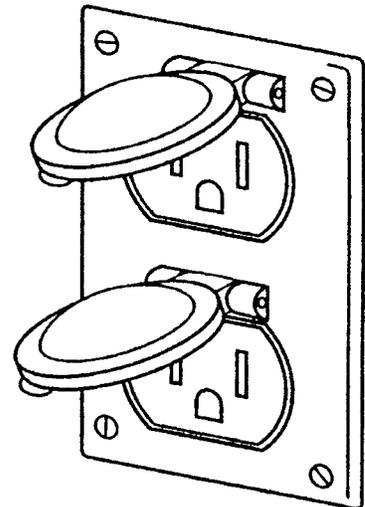
**WAC 296-800-28015 Make sure electrical equipment used or located in wet or damp locations is designed for such use.** You must:

- Make sure fixtures and receptacles located in wet or damp locations are approved for such use. They must be constructed or installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

- Make sure cabinets, fittings, boxes, and other enclosures in wet or damp locations are installed to prevent moisture or water from entering and accumulating inside.
  - In wet locations these enclosures must be weather-proof.
  - Switches, circuit breakers, and switchboards located in wet locations must be in weatherproof enclosures.



BOX



Electrical equipment used in wet locations must be weatherproof.

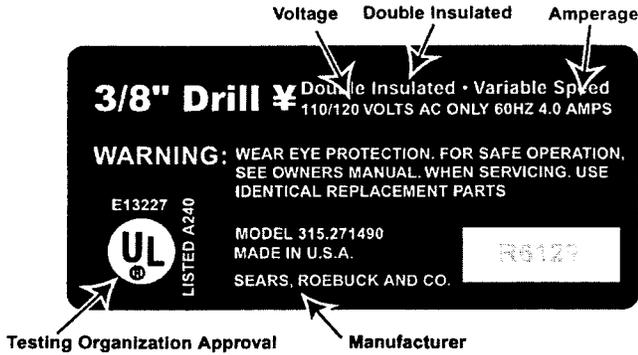
[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-28015, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-28020 Make sure electrical equipment that is not marked is not used.** You must:

- Make sure markings are durable and appropriate to the environment.
- Appropriate markings include:

- The manufacturer's name;
- or
- Trademark;
- or
- The organization responsible for the product;

and  
 – Voltage, current and wattage or other ratings as necessary.

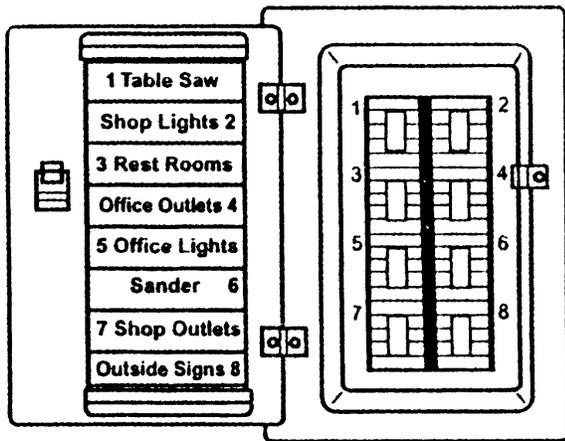


Electrical tools and equipment marked to show manufacturer, approvals and power requirements.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-28020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-28020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-28022 Identify disconnecting means.**

- You must:
- Make sure the disconnect means (such as on/off switches and circuit breakers) is marked to show when it is open and closed and what equipment it controls, unless located and arranged so the purpose is obvious.
  - Make sure each service, feeder and branch circuit is marked, at its disconnecting means or overcurrent device, to show when the circuit is open and closed and what circuit it controls, unless located and arranged so the purpose is obvious.
  - Make sure markings are durable and appropriate to the environment.



Electrical panel circuit breakers labeled to show the equipment or circuits they control.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-28022, filed 5/9/01, effective 9/1/01.]

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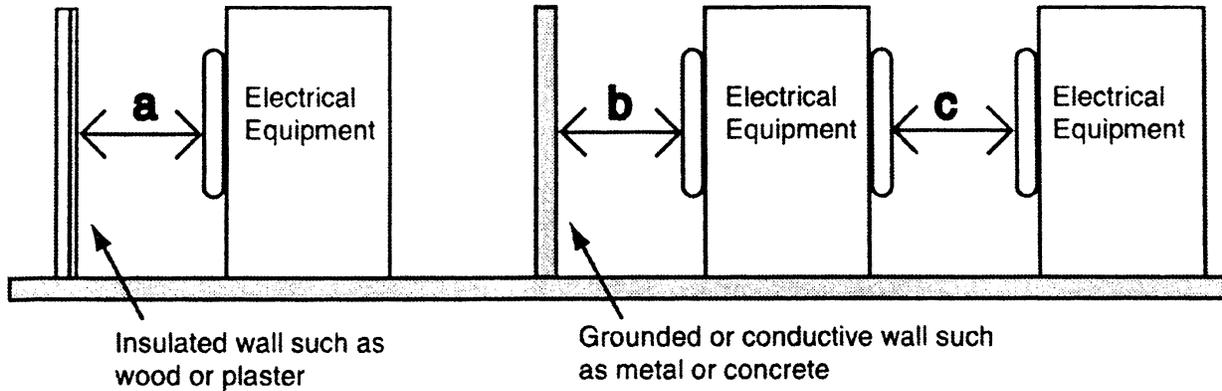
**WAC 296-800-28025 Maintain electrical fittings, boxes, cabinets and outlets in good condition.** You must:

- (1) Do the following to covers and openings:
- Do the following when conductors enter boxes, cabinets, or fittings:
    - Protect the conductor (wires) from abrasion.
    - Effectively close the openings where conductors enter.
    - Effectively close all unused openings.
  - Provide pull boxes, junction boxes, and fittings with covers approved for the purpose.
  - Make sure each outlet box has a cover, faceplate, or fixture canopy in completed installations.
  - Make sure covers for outlet boxes with openings for flexible cord pendants have bushings to protect the cord, or have a smooth and well rounded surface where the cord touches the opening.
  - Ground metal covers.
- (2) Make sure the area in front of electrical panels, circuit breaker boxes and similar equipment which operates at 600 volts or less:
- Has sufficient working area at least thirty inches wide for operation and maintenance of the equipment.
  - Is kept clear and free of stored materials so that employees can access this equipment for servicing, adjustments or maintenance.
  - Has at least one access route to provide free and unobstructed access.
  - Has at least three feet of working space in front, measured from the exposed live parts or the enclosure front. (See the work clearance table on the following page.)
  - Has adequate indoor lighting.
  - Has at least six feet three inches of headroom.

This table shows the area you must keep clear depending on the layout of the electrical equipment.

Conditions*	0 - 150 volts to ground	151 - 600 volts to ground
a	3 ft.	3 ft.
b	3 ft.	3 1/2 ft.
c	3 ft.	4 ft.

- Minimum clear distances may be 2 feet 6 inches for equipment built or installed before 3/20/82.
- Conditions a, b, and c are as follows:
    - a = Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating material. Insulated wire or insulated bus bars operating at not over 300 volts are not considered live parts.
    - b = Exposed live parts on one side and grounded parts on the other side.
    - c = Exposed live parts on both sides of the workspace (not guarded as provided in condition (a) with the operator between the panels).



Distances are measured from live parts if they are exposed or from the enclosure front if live parts are enclosed.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-28025, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-28025, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-28030 Maintain all flexible cords and cables in good condition and use safely.**

**Exemption:** These rules do not apply to cords and cables that are an internal part of factory assembled appliances and equipment, like the windings on motors or wiring inside electrical panels.

**Note:** Flexible cords and cables are typically used to connect electrical equipment to a power source. These cords can have an electrical plug to connect to a power source or can be permanently wired into the power source. The terms flexible cords, extension cord, cables and electrical cords all refer to a type of flexible cord.

**You must:**

(1) Perform visual inspections.

• On portable cord- and plug-connected equipment and extension cords before use on each work shift. Defects and damage to look for include:

- Loose parts.
- Deformed or missing pins.
- External defects and damage.
- Damage to the outer covering or insulation.
- Pinched or crushed covering or insulation that might indicate internal damage.

**Exemption:** You do not need to visually inspect portable cord- and plug-connected equipment and extension cords that stay connected once in place and are not exposed to damage until they are moved.

**You must:**

• Remove from service any defective or damaged cord until repaired and tested.

• Make sure flexible cords and cables are used as described.

(2) Use.

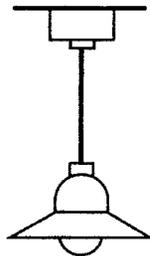
• Use flexible cords only as follows:

- Wiring of equipment and appliances.
- Data processing cables approved as a part of the data processing system.
- Pendants.
- Wiring for fixtures.
- Connecting portable lamps or appliances to an approved outlet with an attachment plug.
- Connecting stationary equipment that is frequently changed with an attachment plug energized from an approved outlet.
- Preventing noise or vibration transmission.
- Appliances that have been designed to permit removal for maintenance and repair if the appliance is equipped with an attachment plug energized from an approved outlet.
- Elevator cables.
- Wiring of cranes and hoists.

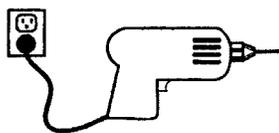
**Common Acceptable Uses of Flexible Cords**



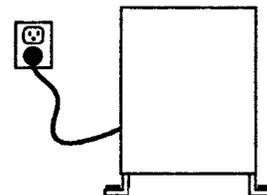
Extension Cord



Pendant Cord Lamp or Control



Portable Appliances Tools and Lamps



Fixed or Stationary Equipment For Easy Maintenance or Replacement

Note: Extension cords (flexible cord sets) may be used on a temporary basis if you follow the rules described in the temporary use section, WAC 296-800-28030(3).

You must:

- Not use flexible cords in the following ways:
  - As a substitute for fixed wiring of a structure.
  - To run through holes in walls, ceilings, or floors.
  - To run through doorways, windows, or similar openings.
  - To attach to building surfaces.
  - To conceal behind building walls, ceilings, or floors.
  - To raise or lower equipment.
- Make sure flexible cords and cables are approved and suitable for:
  - The way they will be used.
  - The location where they will be used.
- Not fasten or hang cords and equipment in any way that could cause damage to the outer jacket or insulation of the cord.
- Make sure insulation on flexible cords and cables is intact.
- Make sure flexible cords and electrical cords are:
  - Connected to devices and fittings so that any pulling force on the cord is prevented from being directly transmitted to joints or terminal screws on the plug.
  - Used only in continuous lengths without splice or tap.
- Prohibit your employees from using wet hands to plug or unplug equipment or extension cords if the equipment is energized.

Note: Hard service flexible cords No. 12 or larger may be repaired or spliced if the insulation, outer sheath properties, and use characteristics of the cord are retained.

You must:

- (3) Provide the following for temporary use.
  - Make sure temporary electrical power and lighting installations that operate at 600 volts or less are used only:
    - During and for remodeling, maintenance, repair or demolition of buildings and similar activities.
    - Experimental or developmental work.
    - For no more than ninety days for:
      - ◆ Christmas decorative lighting.
      - ◆ Carnivals.
      - ◆ Other similar purposes.
  - Make sure flexible cords and electrical cords used on a temporary basis are protected from accidental damage:
    - By avoiding sharp corners and projections
    - If they pass through doorways or other pinchpoints.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-28030, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-28030, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-28035 Guard electrical equipment to prevent your employees from electrical hazards.** You must:

- (1) Guard live parts of electric equipment operating at 50 volts or more against accidental contact by any of the following means:
  - By approved cabinets or other forms of approved enclosures.
  - By location in a room, vault, or similar enclosure that is accessible only to employees qualified to work on the equipment. Entrances to rooms and other guarded locations con-

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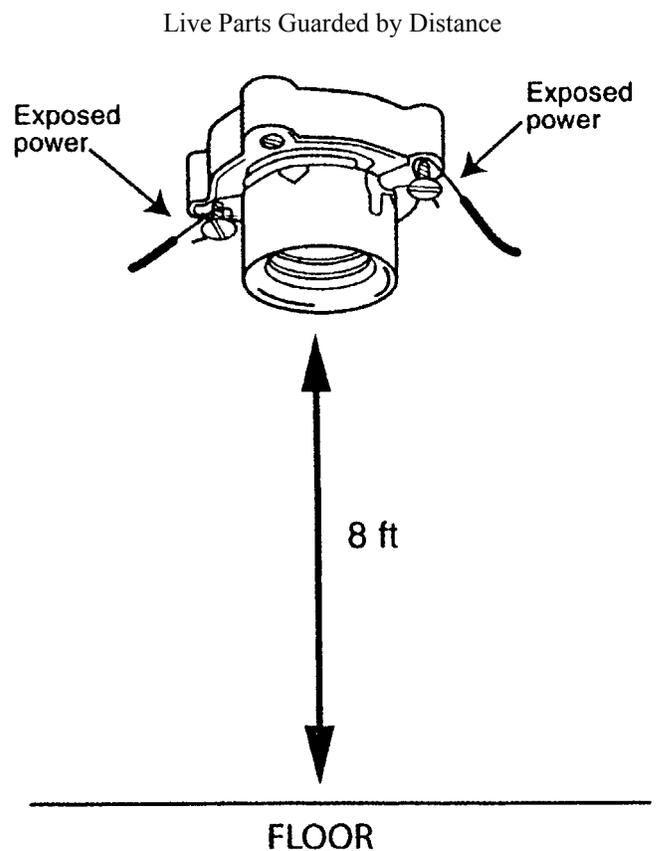
taining exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter.

- By permanent, substantial partitions or screens so that only employees qualified to work on the equipment will have access within reach of the live parts. Any openings must prevent accidental contact with live parts by employees or objects employees carry.
- By location on a balcony, gallery, or platform that will exclude unqualified persons.
- By being located eight feet or more above the floor or other working surface.

(2) Make sure all electrical appliances, fixtures, lampholders, lamps, rosettes, and receptacles do not have live parts normally exposed to employee contact.

- Rosettes and cleat type lampholders at least 8 feet above the ground may have exposed parts.

(3) In locations where electric equipment would be exposed to physical damage, enclosures or guards must be so arranged and of such strength as to prevent such damage.



[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-28035, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-28040 Make sure electrical equipment is effectively grounded.** You must:

- Make sure the path to ground from circuits, equipment, and enclosures is permanent and continuous.
- Make sure equipment connected by cord and plug is grounded under these conditions:
  - Equipment with exposed noncurrent carrying metal parts.

- Cord and plug connected equipment which may become energized.
- Equipment that operates at over 150 volts to ground.
- Equipment in hazardous locations. (WAC 296-24-95613)

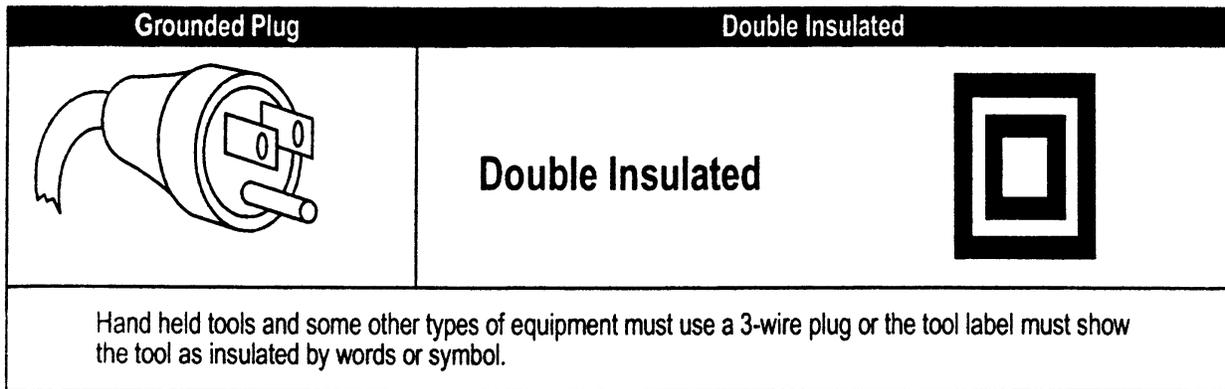
Exemption: This does not apply to guarded motors and metal frames of electrically heated appliances, if the appliance frames are permanently and effectively insulated from ground.

You must:

- Ground the following type of equipment:
  - Hand-held motor-operated tools
  - Refrigerators
  - Freezers

- Air conditioners
- Clothes washers and dryers
- Dishwashers
- Electrical aquarium equipment
- Hedge clippers
- Electric lawn mowers
- Electric snow blowers
- Wet scrubbers
- Tools likely to be used in damp or wet locations
- Appliances used by employees standing on the ground, on metal floors or working inside of metal tanks or boilers
- Portable hand lamps

Note: Grounding can be achieved by: Using tools and appliances equipped with an equipment grounding conductor (three-prong plug and grounded electrical system).

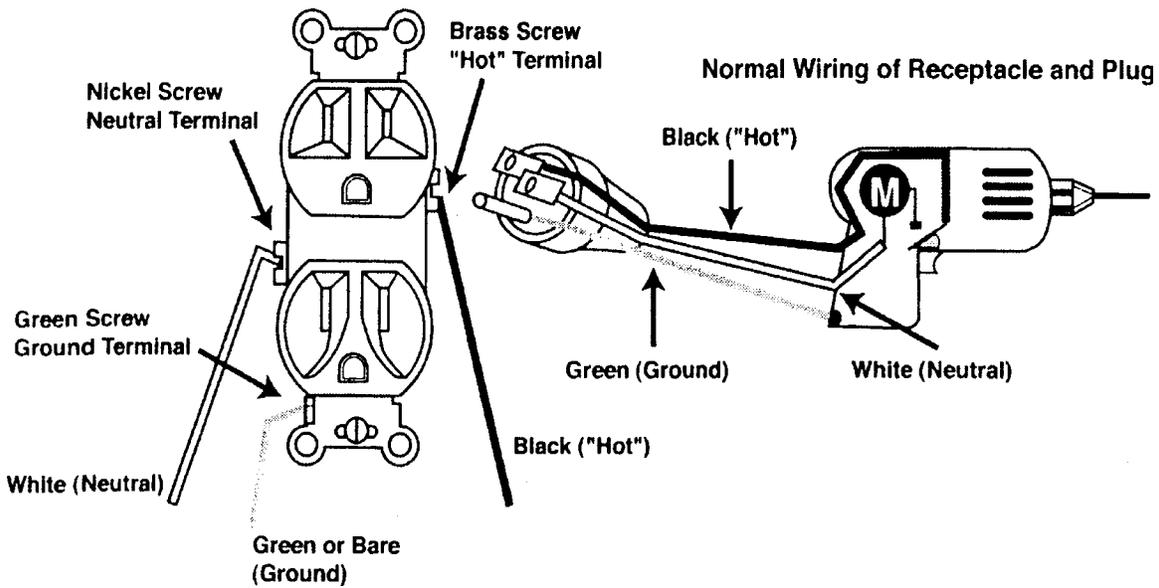


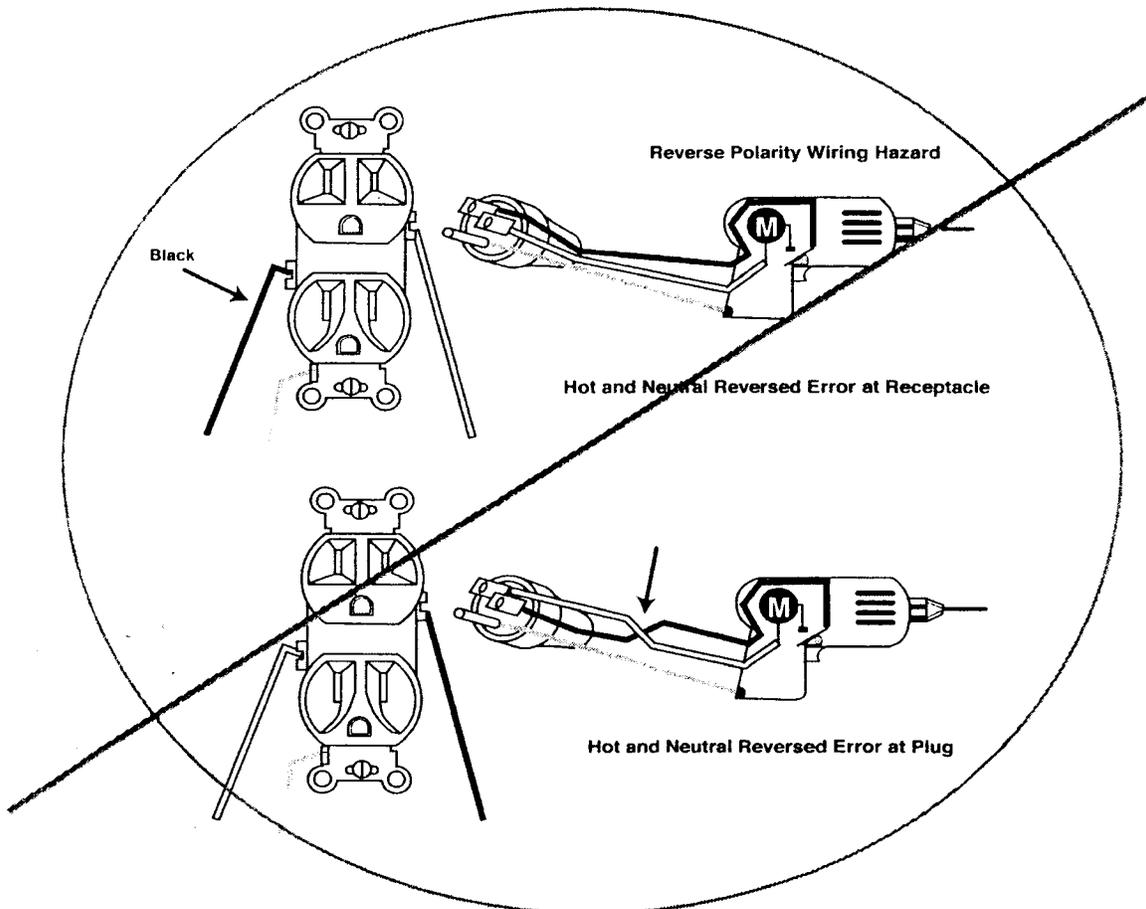
You must:

- Make sure exposed metal parts of fixed equipment that do not conduct electricity, but may become energized, are grounded if the equipment is in a wet or damp location and is not isolated.
- Make sure ground wires are identified and look different than the other conductors (wires).

- Make sure grounded conductors are not attached to any terminal or lead to reverse polarity of the electrical outlet or receptacle. See illustration - Examples of wiring.
- Make sure grounding terminals or grounding-type devices on receptacles, cords, connectors, or attachments plugs are not used for purposes other than grounding.

**EXAMPLES OF WIRING**





**INCORRECT WIRING**

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-28040, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-28040, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-28040, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-28045 Make sure electrical equipment has overcurrent protection.** You must:

- Make sure all electrical circuits that are rated at 600 volts or less have overcurrent protection.
- Protect conductors and equipment according to their ability to safely conduct electrical current.
- Make sure overcurrent devices do not interrupt the continuity of grounded conductors unless all conductors are opened at the same time, except for motor running overload protection.
  - Protect employees from electrical arcing or suddenly moving electrical parts by locating fuses and circuit breakers in safe places. If this is not possible, install shields on fuses and circuit breakers.
- Make sure the following fuses and thermo cutouts have disconnecting mechanisms:
  - All cartridge fuses accessible to nonqualified persons
  - All fuses on circuits over 150 volts to ground
  - All thermal cutouts on circuits over 150 volts to ground
  - The disconnecting mechanisms must be installed so you can disconnect the fuses or thermal cutouts without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.
- Provide easy access to overcurrent devices for each employee or authorized building management personnel.

- Protect the overcurrent devices by locating them away from easily ignitable material.
  - They must be placed to avoid exposure to physical damage.
- Make sure circuit breakers:
  - Clearly indicate when they are open (off) and closed (on)
    - That operate vertically are installed so the handle is in the "up" position when the breaker is closed (on). See WAC 296-24-95603 (2)(c) for more information
    - Used as switches in 120-volt, fluorescent lighting circuit must be approved for that purpose and marked "SWD." See WAC 296-24-95603 (2)(c) for more information
    - That have arcing or suddenly moving parts, are shielded or located so employees will not get burned or injured by the operation of the circuit breaker.
  - ◆ Make sure fuses that have arcing or suddenly moving parts, are shielded or located so employees will not get burned or injured by the operation of the fuses.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-28045, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-28045, filed 5/9/01, effective 9/1/01.]

**PORTABLE FIRE EXTINGUISHERS**

**WAC 296-800-300 Summary—Portable fire extinguishers. Important:**

The following WISHA rule applies to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. Your local fire marshal also enforces fire codes which address fire safety that are more comprehensive and may go beyond WISHA rules.

Your responsibility:

To provide readily accessible, appropriate portable fire extinguishers for employees in your workplace

You must:

Provide portable fire extinguishers in your workplace

*WAC 296-800-30005*

Select and distribute portable fire extinguishers in your workplace

*WAC 296-800-30010*

Make sure that portable fire extinguishers are kept fully charged, in good operating condition, and left in their designated places

*WAC 296-800-30015*

Inspect and test all portable fire extinguishers

*WAC 296-800-30020*

Train your employees to use portable fire extinguishers

*WAC 296-800-30025*

Exemptions:

- You are exempt from the requirements of portable fire extinguishers if you have the following:

- A written fire safety policy that requires the immediate and total evacuation of employees from the workplace when there is a fire alarm signal,

AND

- An emergency action plan and a fire prevention plan which meet the requirements of WAC 296-24-567

AND

- Portable fire extinguishers in your workplace that are not accessible for employee use

- If another WISHA rule requires portable fire extinguishers, then you must comply with these requirements.

- Where extinguishers are provided but are not intended for employee use and you have an emergency action plan and a fire prevention plan (which meet the requirements of WAC 296-24-567), then only the requirements of WAC 296-800-30020 apply.

Note: The introduction has important information about building, electrical and fire codes that may apply to you in addition to WISHA rules. See "How do the WISHA rules relate to building, fire and electrical codes" in the introduction section of this book.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-300, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-300, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-30005 Provide portable fire extinguishers in your workplace. You must:**

(1) Provide approved portable fire extinguishers for your workplace and distribute them so they are readily accessible

- Make sure that your portable fire extinguisher does not use extinguishing agents such as carbon tetrachloride or chlorobromomethane extinguishing agents. In addition, soda-acid foam, loaded stream, antifreeze and water extinguishers of

the inverting type shall not be recharged or placed into service.

(2) Mount, locate, and identify portable fire extinguishers so employees can easily reach them, without being subjected to possible injury.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-30005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-30010 Select and distribute portable fire extinguishers in your workplace. Exemption:**

- This does not apply to the portable fire extinguishers provided for employees to use outside of workplace buildings or structures.

- You are exempt from the distribution requirements of this rule if you have an emergency action plan (that meets requirements of WAC 296-24-567):

- Which designates certain employees to be the only employees authorized to use the available portable fire extinguishers; and

- Requires all other employees in the fire area to immediately evacuate the affected work area upon the sounding of the fire alarm

You must:

- Provide the correct type of portable fire extinguishers and distribute them in your workplace, depending on the type, size, and severity of fire that could occur

- The type of portable fire extinguishers you must have in your workplace depends on the types of fire hazards that exist in your workplace

**Fire Extinguisher Distance Table**

Type of fire hazard extinguisher	Maximum distance from the fire hazard to a fire extinguisher
Type of fire hazard Wood, cloth, paper, rubber (Class A fire hazards)	No more than 75 feet (22.9 m) Note: You may use uniformly spaced standpipe systems or hose stations instead of Class A portable fire extinguishers, if they meet the requirements of WAC 296-24-602 or 296-24-607.
Liquids, grease, gases (Class B fire hazards)	No more than 50 feet (15.2 m) Note: You may choose to use a smaller fire extinguisher in lieu of that required for the 50 foot distance. If you choose to have the smaller fire extinguisher, the travel distance must not be greater than 30 feet. See UFC Standard 10 Chapter 3 for the basic minimum extinguisher rating allowed.
Live electrical equipment and circuits (Class C fire hazards)	Distribute any Class C portable fire extinguishers the same pattern that you have for any Class A or Class B fire hazards. Note: If the electrical equipment is deenergized, you may use a Class A or Class B portable fire extinguisher.

Powder, flakes, and residue from combustible metals, like magnesium and titanium, that build up over a 2-week period (Class D fire hazards)	No more than 75 feet (22.9 m)
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[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-30010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-30010, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-30015 Make sure that portable fire extinguishers are kept fully charged, in operable condition, and left in their designated places.** You must:

- Make sure that fire extinguishers found with deficiencies are removed from service and replaced with a suitable fire extinguisher.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-30015, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-30020 Inspect and test all portable fire extinguishers.** You must:

- Perform inspections:
  - Make sure that portable fire extinguishers or hose systems (used instead of fire extinguishers) are visually inspected monthly
- Perform maintenance checks:
  - Make sure that all portable fire extinguishers are subjected to an annual maintenance check
  - Keep records of all annual maintenance checks and make available to the department upon request
  - ◆ For 1 year after the last maintenance check;
  - OR
  - ◆ For the life of the shell, whichever is less
  - Make sure that equal protection is provided when portable fire extinguishers are removed from service for maintenance and recharging

Exemption: Most stored pressure extinguishers do not require an internal examination. Examples of those that do require an internal examination are those containing a loaded stream agent.

You must:

- Perform hydrostatic testing:

Exemption:

- Dry chemical extinguishers that have nonrefillable disposable containers are exempt from this requirement.
- Manually pressurized pumptanks are exempt from this requirement.

You must:

- Make sure that portable extinguishers are hydrostatically tested:
  - At the intervals listed in Table 1, of this section
  - Whenever they show evidence of corrosion or mechanical injury
- Not perform hydrostatic testing on fire extinguishers if:
  - The unit has been repaired by soldering, welding, brazing, or use of patching compounds
  - The cylinder or shell threads are damaged
  - Corrosion has caused pitting, including corrosion under removable name plate assemblies
  - The extinguisher has been burned in a fire

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– Calcium chloride extinguishing agents have been used in a stainless steel shell

Note: Specific rules regarding conducting hydrostatic tests are covered in WAC 296-24-59212.

You must:

• Maintain records showing that hydrostatic testing has been performed. Provide the following evidence to the department upon request:

- Date of test
- Test pressure used
- The serial number, or other identifier of the fire extinguisher that was tested
- Person or agency performing the test
- Keep records until:
  - The extinguisher is retested;

OR

– The extinguisher is taken out of service, whichever comes first

• Empty and maintain stored-pressure dry chemical extinguishers requiring a 12-year hydrostatic test, every six years:

– When recharging or hydrostatic testing is performed, the 6-year requirement begins from that date

**Hydrostatic Test Table**

Type of Extinguisher	Test Interval (Years)
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (stainless steel shell)	5
Aqueous film forming form (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated, with mild steel shell	12

Note: Due to a manufacturer's recall, stored pressure water extinguishers with fiberglass shell (pre-1976) are prohibited from hydrostatic testing.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-30020, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-30020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-30025 Train your employees to use portable fire extinguishers.** You must:

- Train your employees where you have provided portable fire extinguisher for their use in:
  - The hazards involved with incipient stage fire fighting (the early stage of a fire when it can be extinguished by a portable fire extinguisher)
  - The general principles of fire extinguisher use

[Title 296 WAC—p. 2725]

- Provide the training when they are first hired and then annually.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-30025, filed 5/9/01, effective 9/1/01.]

## EXIT ROUTES AND EMPLOYEE ALARM SYSTEMS

**WAC 296-800-310 Summary.** Your responsibility: To provide and maintain emergency exit routes and to install and maintain adequate employee alarm systems.

Exit routes:

You must:

Provide an adequate number of exit routes.

*WAC 296-800-31005.*

Make sure that exit routes are large enough.

*WAC 296-800-31010.*

Make sure that exit routes meet their specific design and construction requirements.

*WAC 296-800-31015.*

Make sure that each exit route leads outside.

*WAC 296-800-31020.*

Provide unobstructed access to exit routes.

*WAC 296-800-31025.*

Exit doors must be readily opened from the inside.

*WAC 296-800-31030.*

Use side-hinged doors to connect rooms to exit routes.

*WAC 296-800-31035.*

Provide outdoor exit routes that meet requirements.

*WAC 296-800-31040.*

Minimize danger to employees while they are using emergency exit routes.

*WAC 296-800-31045.*

Mark exits adequately.

*WAC 296-800-31050.*

Provide adequate lighting for exit routes and signs.

*WAC 296-800-31053.*

Maintain the fire retardant properties of paints or other coatings.

*WAC 296-800-31055.*

Maintain emergency safeguards.

*WAC 296-800-31060.*

Maintain exit routes during construction and repair.

*WAC 296-800-31065.*

Provide doors in freezer or refrigerated rooms that open from the inside.

*WAC 296-800-31067.*

Employee alarm systems:

You must:

Install and maintain an appropriate employee alarm system.

*WAC 296-800-31070.*

Establish procedures for sounding emergency alarms.

*WAC 296-800-31075.*

Test the employee alarm system.

*WAC 296-800-31080.*

Exemption: This rule does not apply to vehicles, vessels, or other mobile structures.

Note: The introduction has important information about building, electrical and fire codes that may apply to you in addition to WISHA rules. See "How do the WISHA rules relate to building, fire, and electrical codes" in the introduction section of this book.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-310, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-310, filed 5/9/01, effective 9/1/01.]

## EXIT ROUTES

**WAC 296-800-31005 Provide an adequate number of exit routes.** You must:

- Provide a minimum of two exit routes to provide different ways for employees to leave the workplace safely during an emergency (at least two of the exit routes must be remote from one another so employees can safely exit if one exit route becomes blocked or unavailable).

- Provide an adequate number (at least two) of exit routes, considering the kind, number, location and capacity, appropriate to each building according to the following conditions:

- Number of employees
- Size of building
- Arrangement of workplace
- Building occupancy

Note: A single exit route is permitted where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace indicates that a single exit will allow all employees to exit safely during an emergency. Other means of escape, such as fire exits or accessible windows, should be available where only one exit route is provided.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31010 Make sure that exit routes are large enough.** You must:

- Make sure each exit route is large enough to accommodate the maximum-permitted occupant load for each floor served by the route.

- Make sure the capacity of an exit route does not decrease at any point.

- Make sure an exit route is at least 6 feet 8 inches high at all points.

- Make sure objects that stick out into the exit route, such as fans hanging from the ceilings or cabinets on walls, do not reduce the minimum height and width of the exit route.

- Make sure exit routes are at least 28 inches wide at all points between any handrails.

- If necessary, routes must be wider than 28 inches to accommodate the expected occupant load.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-31010, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-31010, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31015 Make sure that exit routes meet their specific design and construction requirements.** You must:

- Make sure each exit is a permanent part of the workplace.

- Make sure an exit route has only those openings necessary to permit access to, or exit from, occupied areas of the workplace.

- Make sure any opening into an exit through a fire wall is protected by a self-closing fire door that remains closed.

- Make sure each fire door, its frame, and its hardware is listed or approved by a nationally recognized testing laboratory.

- Make sure construction materials, used to separate an exit route, have at least:

- One-hour fire resistance rating if the exit connects three stories or less.

- Two-hour fire resistance rating if the exit connects four stories or more.

- Make sure employees are provided with stairs or a ramp, if the exit route is not substantially level.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31015, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31020 Make sure that each exit route leads outside.** You must:

- Make sure that building exit routes lead:

- Directly outside or to a street, walkway; or to an open space with access to the outside.

- To streets, walkways, or open spaces large enough to accommodate all building occupants likely to use the exit.

- Make sure the exit routes clearly show the route employees use to leave the building in an emergency.

- Install a standard safeguard with a warning sign, if a doorway or corner of a building could allow an employee to walk in front of an engine or trolley.

- Use doors, partitions, or other effective means to show employees the correct route out of the building, if the stairs in your exit route lead anywhere but out of the building.

Note: If the stairs in your exit route lead past the exit to the basement, you might install a gate at the point they lead towards that basement. The gate could help your employees stay on the exit route taking them out of the building.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31025 Provide unobstructed access to exit routes.** You must:

- (1) Provide exit routes that are always free of obstructions so all employees can safely exit the building during an emergency.

- (2) Make sure employees are not required to travel to a dead end or through a room that can be locked, such as a restroom.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31025, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31030 Exit doors must be readily opened from the inside.**

Exemption: An exit door may be locked or blocked from the inside in a mental, penal, or correctional institution, if supervisory personnel are continuously on duty and a plan exists to remove employees and inmates during an emergency.

You must:

- Make sure all exit doors readily open from the inside without keys, tools, or special knowledge. A device that locks only from the outside, such as a panic bar, is permitted. An exit door must be free of any device or alarm that could restrict emergency use of an exit if the device or alarm fails.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31030, filed 5/9/01, effective 9/1/01.]

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**WAC 296-800-31035 Use side-hinged doors to connect rooms to exit routes.** You must:

- Use a side-hinged exit door to connect any room to an exit route. The door must swing out when the room:

- Is occupied by more than fifty persons or

- Contains highly flammable or explosive materials.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-31035, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-31035, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31040 Provide outdoor exit routes that meet these requirements.** You must:

- Make sure an outdoor exit route (such as an interior balcony, porch, gallery, or roof) meets all requirements for an indoor exit route. In addition, an outdoor exit route must also:

- Have guardrails to protect unenclosed sides.

- Be covered if snow or ice is likely to accumulate without regular removal.

- Be reasonably straight with smooth, solid, substantially level floors.

- Have no dead ends more than twenty feet long that branch off of the exit route.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31040, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31045 Minimize danger to employees while they are using emergency exit routes.** You must:

- Maintain each exit route to minimize danger to employees during an emergency.

- Keep each exit route free of explosive or highly flammable furnishings and decorations.

- Not require employees to travel toward areas where high hazard materials are stored, unless the route is protected by partitions or physical barriers. High hazard materials are materials that:

- Burn quickly

- Emit poisonous fumes when burned

- Are explosive

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31045, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31050 Mark exits adequately.**

You must:

- Mark each exit with a clearly visible, distinctive sign reading "exit."

- Make sure the letters in the word "EXIT" are at least six inches high and 3/4 inch wide.

- Mark any doorway or passage that might be mistaken for an exit with "not an exit" or with an indication of its actual use.

- Make sure exit signs are a distinctive color.

- Make sure signs are posted and arranged along exit routes to adequately show how to get to the nearest exit and clearly indicate the direction of travel.

- Not obstruct or conceal exit signs in any way.

- Keep exit doors free of signs or decorations that obscure their visibility.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-18-090, § 296-800-31050, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31050, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31053 Provide adequate lighting for exit routes and signs.** You must:

- Illuminate each exit route adequately and reliably.
- Have at least five foot-candles illumination from a reliable light source.
- Make sure any exit signs illuminated by artificial lights and made of translucent material (other than internally illuminated types)
  - Have screens, discs or lens of at least twenty-five square inches in size; and
  - Show red or other designated color on the approach side of the exit.
- Make sure brightly lit signs, displays, or objects in or near the line of vision do not distract attention from the exit sign.
- Make sure exit signs that are self-lighting have a minimum luminance surface value of .06 footlamberts.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31053, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31055 Maintain the fire retardant properties of paints or other coatings.** You must:

- Maintain any paints or other coatings with fire retardant properties so they retain their fire retardant properties.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31055, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31060 Maintain emergency safeguards.** You must:

- Maintain each safeguard in proper working order to protect employees during an emergency. Emergency safeguards include items such as:
  - Sprinkler systems.
  - Alarm systems.
  - Fire doors.
  - Exit lighting.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31060, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31065 Maintain exit routes during construction and repair.** You must:

- Have enough exit routes that comply with these rules before letting your employees occupy a workplace under new construction.
- Make sure that employees do not occupy an existing workplace unless:
  - All exits and existing fire protection are maintained; or
  - Alternate fire protection is provided that ensures an equivalent level of safety.
- Make sure that flammable or explosive materials used during construction or repair do not expose employees to additional hazards or prevent emergency escape.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31065, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31067 Provide doors in freezer or refrigerated rooms that open from the inside.** You must:

- Make sure that walk-in refrigerators or freezer rooms have doors with opening devices allowing them to be opened from the inside even when they are locked from the outside.

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[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31067, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31070 Install and maintain an appropriate employee alarm system.**

- Exemptions:
- If you have ten or fewer employees in a particular workplace, you can use direct voice communication to sound the alarm, if all employees can hear it. For this kind of workplace, you do not need a back-up system.
  - In workplaces where employees would not otherwise be able to recognize audible or visible alarms, you can use tactile devices to alert them.

You must:

- Make sure that a working employee alarm system with a distinctive signal to warn employees of fire or other emergencies is installed and maintained, unless employees can see or smell a fire or other hazard.
- Make sure that the following systems meet the requirements of this rule, if you use them as your employee alarm system:
  - Supervisory alarms
  - Discharge alarms
  - Detection systems required on fixed extinguishing systems
  - Detection systems required on fire suppression systems
- Make sure that your employee alarm systems are:
  - Providing enough warning to allow employees to safely escape from the workplace, the immediate work area, or both.
  - Noticeable above surrounding noise or light levels by all employees in the affected portions of the workplace.
  - Distinctive and recognizable as a signal, to evacuate the work area.
  - Restored to working order as soon as possible, after each test or alarm.
  - Supervised, if installed after July 1, 1982, and if it has that capacity.
  - Able to alert assigned personnel whenever a malfunction exists in the system.
  - Adequately warning employees of emergencies.
  - Serviced, maintained, and tested by a person trained in the alarm system's design and functions to keep the system operating reliably and safely.
  - In working order, except when undergoing repairs or maintenance.
  - Warning employees of fire or other emergencies with a distinctive signal, if they are not able to see or smell a fire or other hazard.
  - Manual actuation devices that, if provided, are unobstructed, easy to find, and readily accessible.
  - Using alarm devices, components, combinations of devices, or systems with approved construction and installation. This applies to steam whistles, air horns, strobe lights, or similar lighting devices, as well as tactile devices.
  - Supplied with spare alarm devices available to restore the system promptly if a component breaks, is worn, or destroyed.
  - Kept in full operating condition by maintaining and replacing power supplies as often as necessary.

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– Supplied with a back-up means of alarm, such as employee runners or telephones, when regular systems are out of service.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31070, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31075 Establish procedures for sounding emergency alarms.** You must:

- Explain to each employee how to sound the alert for emergencies. Methods of reporting emergencies can include:
  - Manual pull box alarms.
  - Public address systems.
  - Radio.
  - Telephones.
- Post emergency numbers near telephones, employee notice boards, or other conspicuous locations, if you use telephones to report emergencies.
- Require that all emergency messages have priority over all nonemergency messages if the communication system also serves as an employee alarm system.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31075, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-31080 Test the employee alarm system.** You must:

- Test the reliability and adequacy of your employee alarm system every two months.
  - Use a different activation device in each test of a multiactuation device system, so the entire alarm system gets tested.
- Make sure that supervised (monitored) employee alarm systems are tested at least once a year for reliability and adequacy.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-31080, filed 5/9/01, effective 9/1/01.]

## ACCIDENT REPORTING AND INVESTIGATING

**WAC 296-800-320 Summary.** Your responsibility:

To report and conduct an investigation of certain types of accidents.

**You must:**

Report the death, or probable death, of any employee, or the in-patient hospitalization of 2 or more employees within 8 hours

*WAC 296-800-32005*

Make sure that any equipment involved in an accident is not moved.

*WAC 296-800-32010*

Assign people to assist the department of labor and industries

*WAC 296-800-32015*

Conduct a preliminary investigation for all serious injuries

*WAC 296-800-32020*

Document the investigation findings

*WAC 296-800-32025*

Note: Call the nearest office of the department of labor and industries at 1-800-4BE SAFE or call Occupational Safety and Health Administration (OSHA) at 1-800-321-6742, to report the death, probable death of any employee or the in-patient

hospitalization of 2 or more employees within 8 hours, after handling medical emergencies.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-320, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-320, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-32005 Report the death, probable death of any employee, or the in-patient hospitalization of 2 or more employees within 8 hours.** You must:

- Contact the nearest office of the department of labor and industries in person or by phone at 1-800-4BE SAFE to report within 8 hours of the work-related incident or accident,
  - A death
  - A probable death
  - 2 or more employees are admitted to the hospital, or
  - Contact the Occupational Safety and Health Administration (OSHA) by calling its central number at 1-800-321-6742.
- Provide the following information within 30 days concerning any accident involving a fatality or hospitalization of 2 or more employees:

- Name of the work place
- Location of the incident
- Time and date of the incident
- Number of fatalities or hospitalized employees
- Contact person
- Phone number
- Brief description of the incident

Note: If you do not learn about the incident at the time it occurs, you must report the incident within 8 hours of the time it was reported to you, your agent, or employee.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-23-060, § 296-800-32005, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-32005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-32010 Make sure that any equipment involved in an accident is not moved.** You must:

- Not move equipment involved in a work or work related accident or incident if any of the following results:
  - A death
  - A probable death
  - 2 or more employees are sent to the hospital
- Not move the equipment until a representative of the department of labor and industries investigates the incident and releases the equipment unless:
  - Moving the equipment is necessary to:
    - ◆ Remove any victims
    - ◆ Prevent further incidents and injuries

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-32010, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-32015 Assign people to assist the department of labor and industries.** You must:

- Assign witnesses and other employees to assist department of labor and industries personnel who arrive at the scene to investigate the incident involving:
  - A death
  - Probable death
  - 2 or more employees are sent to the hospital.
- Include:
  - The immediate supervisor
  - Employees who were witnesses to the incident

– Other employees the investigator feels are necessary to complete the investigation

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-32015, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-32020 Conduct a preliminary investigation for all serious injuries.** You must:

- Make sure your preliminary investigation is conducted to evaluate the facts relating to the cause of the incident by the following people:

- A person designated by the employer
- The immediate supervisor of the injured employee
- Witnesses
- An employee representative, such as a shop steward or other person chosen by the employees to represent them
  - Any other person who has the experience and skills.
- If the employee representative is the business agent of the employee bargaining unit and is unavailable to participate without delaying the investigation group, you may proceed, by using one of the following:
  - The shop steward
  - An employee representative member of your safety committee
  - A person selected by all employees to represent them

Note: A preliminary investigation includes noting information such as the following:

- Where did the accident or incident occur?
- What time did it occur?
- What people were present?
- What was the employee doing at the time of the accident or incident?
- What happened during the accident or incident?

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-32020, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-32025 Document the preliminary investigation findings.** You must:

- Document the preliminary investigation findings for use at any formal investigation.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-32025, filed 8/1/02, effective 10/1/02; 01-11-038, § 296-800-32025, filed 5/9/01, effective 9/1/01.]

## RELEASING ACCIDENT INVESTIGATION REPORTS

**WAC 296-800-330 Releasing accident investigation reports.** The department must:

- Keep accident investigations and related reports confidential.
- Not freely release results of accident investigations and related reports that are confidential.
- Make available accident investigation reports, without the need of a court order, only to the following:
  - Injured workers, their legal representatives, or their labor organization representatives.
  - The legal representative or labor organization representative of a deceased worker.
  - The employer of any injured or deceased worker.
  - Any other employer or person whose actions or business operations are the subject of the report or investigation.

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– Any attorney representing a party in any pending legal action in which an investigative report constitutes material and relevant evidence.

– Employees of governmental agencies in the performance of their official duties.

– Any beneficiary of a deceased worker actually receiving benefits under the terms of Title 51 RCW, the Industrial Insurance Act.

Note: The records officer may provide accident investigation reports to the closest surviving member of the deceased worker's immediate family.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-330, filed 5/9/01, effective 9/1/01.]

## PROTECTING THE IDENTITY OF THE SOURCE OF CONFIDENTIAL INFORMATION

**WAC 296-800-340 Protecting the identity of the source of confidential information.** The department must:

- Not reveal the source of information when a promise has been made to keep the identity of the source confidential.
- Not disclose information that would reveal the source's identity, whenever a department file contains an investigative report or information from a source under a promise of confidentiality.

– The contents of an investigative report may be withheld only to the extent necessary to conceal the identity of the source.

– When information is withheld, the records officer must give a general characterization of the information withheld, but must not reveal the identity of the information's source.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-340, filed 5/9/01, effective 9/1/01.]

## USING STANDARDS FROM NATIONAL ORGANIZATIONS AND FEDERAL AGENCIES

**WAC 296-800-360 Rule.** Your responsibility: To use the safety and health standards from national organizations and federal agencies, when directed to by WISHA rules.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-360, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-36005 Comply with standards national organizations or of federal agencies when referenced in WISHA rules.** You must:

- Use the following to be in compliance with WISHA rules:
  - The edition of the standard specified in the WISHA rule or
  - Any edition published after the edition specified in the WISHA rule.

Note: The specific standards referenced in the WISHA rules are available:

• For review at your local department of labor and industries office.

- See <http://www.wa.gov/lni/pa/direct.htm>
- Through the local library system
- Through the issuing organization.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 01-11-038, § 296-800-36005, filed 5/9/01, effective 9/1/01.]

**WAC 296-800-370 Definitions.****Abatement Action Plans**

Refers to your written plans for correcting a WISHA violation.

**Abatement date**

The date on the citation when you must comply with specific safety and health standards listed on the citation and notice of assessment or the corrective notice of redetermination.

**Acceptable**

As used in **Electrical, WAC 296-800-280** means an installation or equipment is acceptable to the director of labor and industries, and approved:

- If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or
- With respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another federal agency, or by a state, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with the provisions of the National Electrical Code as applied in this section;

**OR**

- With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his/her authorized representatives. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

**Accepted**

As used in **Electrical, WAC 296-800-280** means an installation is accepted if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes.

**Access**

As used in material safety data sheets (MSDSs) as Exposure Records, WAC 296-800-180 means the right and opportunity to examine and copy exposure records.

**Affected employees**

As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means employees exposed to hazards identified as violations in a citation.

**Analysis using exposure or medical records**

- An analysis using exposure records or medical records can be any collection of data or a statistical study. It can be based on either:
  - Partial or complete information from individual employee exposure or medical records or
  - Information collected from health insurance claim records
- The analysis is not final until it has been:
  - Reported to the employer or
  - Completed by the person responsible for the analysis

**ANSI**

This is an acronym for the American National Standards Institute.

**Approved means:**

- Approved by the director of the department of labor and industries or their authorized representative, or by an organization that is specifically named in a rule, such as Underwriters' Laboratories (UL), Mine Safety and Health Administration (MSHA), or the National Institute for Occupational Safety and Health (NIOSH).

- As used in **Electrical, WAC 296-800-280** means acceptable to the authority enforcing this section. The authority enforcing this section is the director of labor and industries. The definition of acceptable indicates what is acceptable to the director and therefore approved.

**Assistant director**

The assistant director for the WISHA services division at the department of labor and industries or his/her designated representative.

**ASTM**

This is an acronym for American Society for Testing and Materials.

**Attachment plug or plug**

As used in the basic electrical rules, WAC 296-800-280 means the attachment at the end of a flexible cord or cable that is part of a piece of electrical equipment. When it is inserted into an outlet or receptacle, it connects the conductors supplying electrical power from the outlet to the flexible cable.

**Bare conductor**

A conductor that does not have any covering or insulation.

**Bathroom**

A room maintained within or on the premises of any place of employment, containing toilets that flush for use by employees.

**Biological agents**

Organisms or their by-products.

**Board**

As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means the board of industrial insurance appeals.

**Ceiling**

An exposure limit that must not be exceeded during any part of the employee's workday. The ceiling must be determined over the shortest time period feasible and should not exceed fifteen minutes.

**Certification**

As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means refers to an employer's written statement describing when and how a citation violation was corrected.

**CFR**

This is an acronym for Code of Federal Regulations.

**Chemical**

Any element, chemical compound, or mixture of elements and/or compounds.

**Chemical agents (airborne or contact)**

A chemical agent is any of the following:

- Airborne chemical agent which is any of the following:
  - Dust - solid particles suspended in air, that are created by actions such as:
    - Handling.
    - Drilling.

- Crushing.
- Grinding.
- Rapid impact.
- Detonation.
- Decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, and grain.
  - Fume - solid particles suspended in air, that are created by condensation from the gaseous state.
  - Gas - a normally formless fluid, such as air, which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.
  - Mist - liquid droplets suspended in air. Mist is created by:

- Condensation from the gaseous to the liquid state;

**OR**

- Converting a liquid into a dispersed state with actions such as splashing, foaming, spraying or atomizing.

- Vapor - the gaseous form of a substance that is normally in the solid or liquid state.

- Contact chemical agent which is any of the following:
  - Corrosive - a substance that, upon contact, causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above.

- Irritant - a substance that will induce a local inflammatory reaction upon immediate, prolonged, or repeated contact with normal living tissue.

- Toxicant - a substance that has the inherent capacity to produce personal injury or illness to individuals by absorption through any body surface.

#### **Chemical manufacturer**

An employer with a workplace where one or more chemicals are produced for use or distribution.

#### **Chemical name**

The scientific designation of a chemical in accordance with one of the following:

- The nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC)

- The Chemical Abstracts Service (CAS) rules of nomenclature

- A name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

#### **Circuit breaker**

- Is a device used to manually open or close a circuit. This device will also open the circuit automatically and without damage to the breaker when a predetermined overcurrent is applied. (600 volts nominal or less)

- Is a switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit. (Over 600 volts nominal)

#### **Citation**

Refers to the citation and notice issued to an employer for any violation of WISHA safety and health rules. A citation and notice may be referred to as a citation and notice of assessment but is more commonly referred to as a citation.

#### **Combustible liquid**

A combustible liquid has a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). Mixtures with at least

99% of their components having flashpoints of 200°F (93.3°C) or higher are not considered combustible liquids.

#### **Commercial account**

As used in Employer Chemical Hazard Communication, WAC 296-800-170 means an arrangement in which a retail distributor sells hazardous chemical(s) to an employer, generally in large quantities over time, and/or at costs that are below the regular retail price.

#### **Common name**

As used in Employer Chemical Hazard Communication, WAC 296-800-170 means any designation or identification such as:

- Code name
- Code number
- Trade name
- Brand name
- Generic name used to identify a chemical other than by its chemical name.

#### **Compressed gas**

A gas or mixture of gases that, when in a container, has an absolute pressure exceeding:

- 40 psi at 70°F (21.1°C)

**OR**

- 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C)

Compressed gas can also mean a liquid with a vapor pressure that exceeds 40 psi at 100°F (37.8°C)

#### **Conductor**

A wire that transfers electric power.

#### **Container**

As used in Employer Chemical Hazard Communication, WAC 296-800-170 means any container, except for pipes or piping systems, that contains a hazardous chemical. It can be any of the following:

- Bag
- Barrel
- Bottle
- Box
- Can
- Cylinder
- Drum
- Reaction vessel
- Storage tank

#### **Correction date**

The date by which a violation must be corrected. Final orders or extensions that give additional time to make corrections establish correction dates. A correction date established by an order of the board of industrial insurance appeals remains in effect during any court appeal unless the court suspends the date.

#### **Corrective notice**

Refers to a notice changing a citation and is issued by the department after a citation has been appealed.

#### **Corrosive**

A substance that, upon contact, causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above.

#### **Covered conductor**

A conductor that is covered by something else besides electrical insulation.

**Damp location**

As used in basic electrical rules, WAC 296-800-280 means partially protected areas that are exposed to moderate moisture. Outdoor examples include roofed open porches and marquees. Interior examples include basements and barns.

**Department**

Those portions of the department of labor and industries responsible for enforcing the Washington Industrial Safety Act (WISHA).

**Designated representative**

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written authorization.
- The legal representative of a deceased or legally incapacitated employee.

**Director**

The director means the director of the department of labor and industries or their designee.

**Distributor**

A business, other than a chemical manufacturer or importer, that supplies hazardous chemicals to other distributors or to employers.

**Documentation**

As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means material that you submit to prove that a correction is completed. Documentation includes, but is not limited to, photographs, receipts for materials and/or labor.

**Dry location**

As used in basic electrical rules, WAC 296-800-280 means areas not normally subjected to damp or wet conditions. Dry locations may become temporarily damp or wet, such as when constructing a building.

**Dust**

Solid particles suspended in air that are created by actions such as:

- Handling.
- Drilling.
- Crushing.
- Grinding.
- Rapid impact.
- Detonation.
- Decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, and grain.

**Emergency washing facilities**

Emergency washing facilities are emergency showers, eyewashes, eye/face washes, hand-held drench hoses, or other similar units.

**Electrical outlets**

Places on an electric circuit where power is supplied to equipment through receptacles, sockets, and outlets for attachment plugs.

**Employee**

Based on chapter 49.17 RCW, the term employee and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, means an employee of an employer who is employed in the business of his or her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent con-

tract the essence of which is personal labor for an employer under this standard whether by way of manual labor or otherwise.

**Employee exposure record**

As used in material safety data sheets (MSDSs) as exposure records, WAC 296-800-180 means a record containing any of the following kinds of information:

- Environmental (workplace) monitoring or measuring of a toxic substance or harmful physical agent, including personal, area, grab, wipe, or other form of sampling, as well as related collection and analytical methodologies, calculations, and other background data relevant to interpretation of the results obtained;
- Biological monitoring results which directly assess the absorption of a toxic substance or harmful physical agent by body systems (e.g., the level of a chemical in the blood, urine, breath, hair, fingernails, etc.) but not including results which assess the biological effect of a substance or agent or which assess an employee's use of alcohol or drugs;
- Material safety data sheets indicating that the material may pose a hazard to human health;

**OR**

- In the absence of the above, a chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common or trade name) of a toxic substance or harmful physical agent.

**Employer**

Based on chapter 49.17 RCW, an employer is any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: Provided, That any persons, partnership, or business entity not having employees, and who is covered by the Industrial Insurance Act must be considered both an employer and an employee.

**Exit**

Provides a way of travel out of the workplace.

**Exit route**

A continuous and unobstructed path of exit travel from any point within a workplace to safety outside.

**Explosive**

A chemical that causes a sudden, almost instant release of pressure, gas, and heat when exposed to a sudden shock, pressure, or high temperature.

**Exposed live parts**

Electrical parts that are:

- Not suitably guarded, isolated, or insulated

**AND**

- Capable of being accidentally touched or approached closer than a safe distance.

**Exposed wiring methods**

Involve working with electrical wires that are attached to surfaces or behind panels designed to allow access to the wires.

**Exposure or exposed**

As used in employer chemical hazard communication, WAC 296-800-170 and material safety data sheets (MSDSs) as exposure records, WAC 296-800-180. An employee has been, or may have possibly been, subjected to a hazardous chemical, toxic substance or harmful physical agent while working. An employee could have been exposed to hazardous chemicals, toxic substances, or harmful physical agents in any of the following ways:

- Inhalation
- Ingestion
- Skin contact
- Absorption
- Related means.

The terms exposure and exposed only cover workplace exposure involving a toxic substance or harmful physical agent in the workplace different from typical nonoccupational situations in the way it is:

- Used
- Handled
- Stored
- Generated
- Present

**Exposure record**

See definition for employee exposure record.

**Extension ladder**

A portable ladder with 2 or more sections and is not self-supporting. The 2 or more sections travel in guides or brackets that let you change the length. The size of a portable ladder is determined by adding together the length of each section.

**Failure-to-abate**

Any violation(s) resulting from not complying with an abatement date.

**Final order**

Any of the following (unless an employer or other party files a timely appeal):

- Citation and notice;
- Corrective notice;
- Decision and order from the board of industrial insurance appeals;
- Denial of petition for review from the board of industrial insurance appeals; or
- Decision from a Washington State superior court, court of appeals, or the state supreme court.

**Final order date**

The date a final order is issued.

**First aid**

The extent of treatment you would expect from a person trained in basic first aid, using supplies from a first-aid kit.

Tests, such as X rays, must not be confused with treatment.

**Flammable**

A chemical covered by one of the following categories:

- Aerosol flammable means an aerosol that, when tested by the method described in 16 CFR 1500.45 yields either a flame projection more than 18 inches at full valve opening or a flashback (a flame extending back to the valve) at any degree of valve opening;
- Gas, flammable means:

– A gas that, at temperature and pressure of the surrounding area, forms a flammable mixture with air at a concentration of 13% by volume or less or

– A gas that, at temperature and pressure of the surrounding area, forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.

- Liquid, flammable means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99% or more of the total volume of the mixture.

- Solid, flammable means a solid, other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that is likely to cause fire through friction, moisture absorption, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily. Solid, inflammable also means that when the substance is ignited, it burns so powerfully and persistently that it creates a serious hazard. A chemical must be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

**Flashpoint**

- The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested by any of the following measurement methods:

- Tagliabue closed tester: (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

- Pensky-Martens closed tester: (See American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

- Setaflash closed tester: (See American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78).)

**Note:** Organic peroxides, which undergo auto accelerating thermal decomposition, are excluded from any of the flashpoint measurement methods specified above.

**Flexible cords and cables**

Typically used to connect electrical equipment to an outlet or receptacle. These cords can have an attachment plug to connect to a power source or can be permanently wired into the power source. Flexible cords, extension cords, cables and electrical cords are all examples of flexible cord.

**Floor hole**

An opening in any floor, platform, pavement, or yard that measures at least one inch but less than 12 inches at its smallest dimension and through which materials and tools (but not people) can fall.

Examples of floor holes are:

- Belt holes
- Pipe openings
- Slot openings

**Floor opening**

An opening in any floor, platform, pavement, or yard that measures at least 12 inches in its smallest dimension and through which a person can fall.

Examples of floor openings are:

- Hatchways
- Stair or ladder openings
- Pits
- Large manholes

The following are NOT considered floor openings:

- Openings occupied by elevators
- Dumbwaiters
- Conveyors
- Machinery
- Containers

**Foreseeable emergency**

As used in Employer Chemical Hazard Communication, WAC 296-800-170 means any potential event that could result in an uncontrolled release of a hazardous chemical into the workplace. Examples of foreseeable emergencies include equipment failure, rupture of containers, or failure of control equipment.

**Fume**

Solid particles suspended in air that are created by condensation from the gaseous state.

**Gas**

A normally formless fluid, such as air, which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.

**Ground**

As used in Electrical, WAC 296-800-280, a connection between an electrical circuit or equipment and the earth or other conducting body besides the earth. This connection can be intentional or accidental.

**Grounded**

A connection has been made between an electrical circuit or equipment and the earth or another conducting body besides the earth.

**Grounded conductor**

A system or circuit conductor that is intentionally grounded.

**Ground-fault circuit-interrupter**

A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

**Grounding conductor**

Is used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

**Grounding conductor, equipment**

A conductor used to connect noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

**Guarded**

Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of being accidentally touched or approached closer than a safe distance.

**Hand-held drench hoses**

Hand-held drench hoses are single-headed emergency washing devices connected to a flexible hose that can be used to irrigate and flush the face or other body parts.

**Handrail**

A single bar or pipe supported on brackets from a wall or partition to provide a continuous handhold for persons using a stair.

**Harmful physical agent**

Any physical stress such as noise, vibration, repetitive motion, heat, cold, ionizing and nonionizing radiation, and hypo- or hyperbaric pressure which:

- Is listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) *Registry of Toxic Effects of Chemical Substances* (RTECS); or
- Has shown positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer;

**OR**

- Is the subject of a material safety data sheet kept by or known to the employer showing that the material may pose a hazard to human health.

**Hazard**

Any condition, potential or inherent, which can cause injury, death, or occupational disease.

**Hazard warning**

As used in Employer Chemical Hazard Communication, WAC 296-800-170 can be a combination of words, pictures, symbols, or combination appearing on a label or other appropriate form of warning which shows the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s).

**Note:** See definition for physical hazard and health hazard to determine which hazards must be covered.

**Hazardous chemical**

Any chemical that is a physical or health hazard.

**Health hazard**

A chemical, mixture, biological agent, or physical agent that may cause health effects in short- or long-term exposed employees. Based on statistically significant evidence from at least one study conducted using established scientific principles. Health hazards include:

- Carcinogens
- Toxic or highly toxic agents
- Reproductive toxins
- Irritants
- Corrosives
- Sensitizers
- Hepatotoxins (liver toxins)
- Nephrotoxins (kidney toxins)
- Neurotoxins (nervous system toxins)
- Substances that act on the hematopoietic system (blood or blood-forming system)
  - Substances that can damage the lungs, skin, eyes, or mucous membranes
  - Hot or cold conditions.

**Hospitalization**

To be sent to, to go to, or be admitted to, a hospital or an equivalent medical facility and receive medical treatment

beyond first-aid treatment, regardless of the length of stay in the hospital or medical facility.

**Identity**

As used in Employer Chemical Hazard Communication, WAC 296-800-170 means any chemical or common name listed on the material safety data sheet (MSDS) for the specific chemical. Each identity used must allow cross-references among the:

- Required list of hazardous chemicals
- Chemical label
- MSDSs

**Imminent danger violation**

Any violation(s) resulting from conditions or practices in any place of employment, which are such that a danger exists which could reasonably be expected to cause death or serious physical harm, immediately or before such danger can be eliminated through the enforcement procedures otherwise provided by the Washington Industrial Safety and Health Act.

**Importer**

The first business within the Customs Territory of the USA that:

- Receives hazardous chemicals produced in other countries

**AND**

- Supplies them to distributors or employers within the USA

**Insulated**

A conductor has been completely covered by a material that is recognized as electrical insulation and is thick enough based on:

- The amount of voltage involved

**AND**

- The type of covering material

**Interim waiver**

An order granted by the department allowing an employer to vary from WISHA requirements until the department decides to grant a permanent or temporary waiver.

**Irritant**

A substance that will induce a local inflammatory reaction upon immediate, prolonged, or repeated contact with normal living tissue.

**Ladder**

Consists of 2 side rails joined at regular intervals by crosspieces called steps, rungs, or cleats. These steps are used to climb up or down.

**Listed**

Equipment is listed if it:

- Is listed in a publication by a nationally recognized laboratory (such as UL, underwriters laboratory) that inspects the production of that type of equipment,

**AND**

- States the equipment meets nationally recognized standards or has been tested and found safe to use in a specific manner.

**Material safety data sheet (MSDS)**

Written, printed, or electronic information (on paper, microfiche, or on-screen) that informs manufacturers, distributors, employers or employees about a hazardous chemical, its hazards, and protective measures as required by material

safety data sheet and label preparation, chapter 296-839 WAC.

**Medical treatment**

Treatment provided by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first-aid treatment even if provided by a physician or registered professional personnel.

**Mist**

Liquid droplets suspended in air. Mist is created by:

- Condensation from the gaseous to the liquid state;

**OR**

- Converting a liquid into a dispersed state with actions such as splashing, foaming, spraying or atomizing.

**Mixture**

As used in Employer Chemical Hazard Communication, WAC 296-800-170, any combination of 2 or more chemicals (if that combination did not result from a chemical reaction).

**Movable equipment**

As used in WAC 296-800-35052, a hand-held or non-hand-held machine or device;

- That is powered or nonpowered;

**AND**

- Can be moved within or between worksites

**Must**

Must means mandatory.

**NEMA**

These initials stand for National Electrical Manufacturing Association.

**NFPA**

This is an acronym for National Fire Protection Association.

**Nose**

The portion of the stair tread that projects over the face of the riser below it.

**Occupational Safety and Health Administration (OSHA)**

Created in 1970 when the U.S. Congress passed the Occupational Safety and Health Act, the Occupational Safety and Health Administration (OSHA) provides safety on the job for workers. OSHA oversees state plans (such as WISHA in Washington) that have elected to administer the safety and health program for their state. OSHA requires WISHA rules to be at least as effective as OSHA rules.

**Office work environment**

An indoor or enclosed occupied space where clerical work, administration, or business is carried out.

In addition, it includes:

- Other workplace spaces controlled by the employer and used by office workers, such as cafeterias, meeting rooms, and washrooms.

- Office areas of manufacturing and production facilities, not including process areas.

- Office areas of businesses such as food and beverage establishments, agricultural operations, construction, commercial trade, services, etc.

**Open riser**

A stair step with an air space between treads has an open riser.

**Organic peroxide**

This is an organic compound containing the bivalent-O-O-structure. It may be considered a structural derivative of

hydrogen peroxide if one or both of the hydrogen atoms has been replaced by an organic radical.

**Outlet**

See definition for electrical outlets.

**Oxidizer**

A chemical other than a blasting agent or explosive as defined in WAC 296-52-60130 or CFR 1910.109(a), that starts or promotes combustion in other materials, causing fire either of itself or through the release of oxygen or other gases.

**Permissible exposure limits (PELs)**

Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are specified in applicable WISHA rules.

**Person**

Based on chapter 49.17 RCW, one or more individuals, partnerships, associations, corporations, business trusts, legal representatives, or any organized group of persons.

**Personal eyewash units**

Personal eyewash units are portable, supplementary units that support plumbed units or self-contained units, or both, by delivering immediate flushing for less than fifteen minutes.

**Personal service room**

Used for activities not directly connected with a business' production or service function such as:

- First aid
- Medical services
- Dressing
- Showering
- Bathrooms
- Washing
- Eating

**Personnel**

See the definition for employees.

**Physical hazard**

As used in Employer Chemical Hazard Communication, WAC 296-800-170 means a chemical that has scientifically valid evidence to show it is one of the following:

- Combustible liquid
- Compressed gas
- Explosive
- Flammable
- Organic peroxide
- Oxidizer
- Pyrophoric
- Unstable (reactive)
- Water reactive

**Platform**

Platform means an extended step or landing that breaks a continuous run of stairs.

**Plug**

See definition for attachment plug.

**Potable water**

Water that you can safely drink. It meets specific safety standards prescribed by the United States Environmental Protection Agency's National Interim Primary Drinking Water Regulations, published in 40 CFR Part 141, and 40 CFR 147.2400.

**Predictable and regular basis**

Employee functions such as, but not limited to, inspection, service, repair and maintenance which are performed

- at least once every 2 weeks

**OR**

• 4 man-hours or more during any sequential 4-week period (to calculate man-hours multiply the number of employees by the number of hours during a 4-week period).

**Produce**

As used in Employer Chemical Hazard Communication, WAC 296-800-170, any one of the following:

- Manufacture
- Process
- Formulate
- Blend
- Extract
- Generate
- Emit
- Repackage

**Purchaser**

As used in Employer Chemical Hazard Communication, WAC 296-800-170, an employer who buys one or more hazardous chemicals to use in their workplace.

**Pyrophoric**

A chemical is pyrophoric if it will ignite spontaneously in the air when the temperature is 130°F (54.4°C) or below.

**Qualified person**

A person who has successfully demonstrated the ability to solve problems relating to the subject matter, work, or project, either by:

- Possession of a recognized degree, certificate, or professional standing;

**OR**

- Extensive knowledge, training and experience.

**Railing or standard railing**

A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

**Reassume jurisdiction**

The department has decided to take back its control over a citation and notice being appealed.

**Receptacle or receptacle outlet**

As used in basic electrical rules, WAC 296-800-280 means outlets that accept a plug to supply electric power to equipment through a cord or cable.

**Record**

A record is any item, collection, or grouping of information. Examples include:

- Paper document
- Microfiche
- Microfilm
- X-ray film
- Computer record

**Repeat violation**

A violation is a repeat violation if the employer has been cited one or more times previously for a substantially similar hazard.

**Responsible party**

As used in employer chemical hazard communication, WAC 296-800-170. Someone who can provide appropriate

information about the hazardous chemical and emergency procedures.

**Rise**

The vertical distance from the top of a tread to the top of the next higher tread.

**Riser**

The vertical part of the step at the back of a tread that rises to the front of the tread above.

**Rungs**

Rungs are the cross pieces on ladders that are used to climb up and down the ladder.

**Runway**

An elevated walkway above the surrounding floor or ground level. Examples of runways are footwalks along shafting or walkways between buildings.

**Safety factor**

The term safety factor means the ratio of when something will break versus the actual working stress or safe load when it is used.

**Serious violation**

Serious violation must be deemed to exist in a workplace if there is a substantial probability that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use in such workplace, unless the employer did not, and could not with the exercise of reasonable diligence, know of the presence of the violation.

**Short-term exposure limit (STEL)**

An exposure limit, averaged over a short time period (usually measured for 15 minutes) that must not be exceeded during any part of an employee's workday.

**Should**

Should means recommended.

**Single ladder**

A type of portable ladder with one section.

It is distinguished by all of the following:

- It has one section
- It cannot support itself
- Its length cannot be adjusted

**Smoking**

A person is smoking if they are:

- Lighting up
- Inhaling
- Exhaling
- Carrying a pipe, cigar or cigarette of any kind that is

burning

**Specific chemical identity**

This term applies to chemical substances. It can mean the:

- Chemical name
- Chemical Abstracts Service (CAS) registry number
- Any other information that reveals the precise chemical designation of the substance.

**Stair railing**

A vertical barrier attached to a stairway with an open side to prevent falls. The top surface of the stair railing is used as a handrail

**Stairs or stairway**

A series of steps and landings:

- leading from one level or floor to another,

– leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment

– Used more or less continuously or routinely by employees, or only occasionally by specific individuals.

– With three or more risers

**Standard safeguard**

Safety devices that prevent hazards by their attachment to:

- Machinery
- Appliances
- Tools
- Buildings
- Equipment

These safeguards must be constructed of:

- Metal
- Wood
- Other suitable materials

The department makes the final determination about whether a safeguard is sufficient for its use.

**Step ladder**

A portable ladder with:

- Flat steps
- A hinge at the top allowing the ladder to fold out and support itself
- Its length that cannot be adjusted.

**Time weighted average (TWA<sub>8</sub>)**

An exposure limit, averaged over 8 hours, that must not be exceeded during an employee's work shift.

**Toeboard**

A barrier at floor level along exposed edges of a floor opening, wall opening, platform, runway, or ramp, to prevent falls of materials.

**Toxic chemical**

As used in first aid, WAC 296-800-150, is a chemical that produces serious injury or illness when absorbed through any body surface.

**Toxic substance**

Any chemical substance or biological agent, such as bacteria, virus, and fungus, which is any of the following:

- Listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) *Registry of Toxic Effects of Chemical Substances* (RTECS)
- Shows positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer
- The subject of a material safety data sheet kept by or known to the employer showing the material may pose a hazard to human health.

**Toxicant**

A substance that has the inherent capacity to produce personal injury or illness to individuals by absorption through any body surface.

**Trade secret**

Any confidential:

- Formula
- Pattern
- Process
- Device
- Information
- Collection of information

The trade secret is used in an employer's business and gives an opportunity to gain an advantage over competitors who do not know or use it.

See WAC 296-62-053 for requirements dealing with trade secrets.

**Tread**

As used in stairs and stair railings, WAC 296-800-250 means the horizontal part of the stair step.

**Tread run**

As used in stairs and stair railings, WAC 296-800-250 means the distance from the front of one stair tread to the front of an adjacent tread.

**Tread width**

The distance from front to rear of the same tread including the nose, if used.

**UL (Underwriters' Laboratories, Inc.)**

You will find these initials on electrical cords and equipment. The initials mean the cord or equipment meets the standards set by the Underwriters' Laboratories, Inc.

**Unstable (reactive)**

As used in employer chemical hazard communication, WAC 296-800-170. An unstable or reactive chemical is one that in its pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

**Use**

As used in employer chemical hazard communication, WAC 296-800-170, means to:

- Package
- Handle
- React
- Emit
- Extract
- Generate as a by-product
- Transfer.

**Vapor**

The gaseous form of a substance that is normally in the solid or liquid state.

**Voltage of a circuit**

The greatest effective potential difference between any two conductors or between a conductor and ground.

**Voltage to ground**

The voltage between a conductor and the point or conductor of the grounded circuit. For undergrounded circuits, it is the greatest voltage between the conductor and any other conductor of the circuit.

**Voltage, nominal**

Nominal voltage is a value assigned to a circuit or system to designate its voltage class (120/240, 480Y/277, 600, etc.). The actual circuit voltage can vary from the value if it is within a range that permits the equipment to continue operating in a satisfactory manner.

**WAC**

This is an acronym for **Washington Administrative Code**, which are rules developed to address state law.

**Water-reactive**

As used in Employer Chemical Hazard Communication, WAC 296-800-170, a water-reactive chemical reacts with water to release a gas that is either flammable or presents a health hazard.

**Watertight**

Constructed so that moisture will not enter the enclosure or container.

**Weatherproof**

Constructed or protected so that exposure to the weather will not interfere with successful operation. Rainproof, rain-tight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

**Wet location**

As used in basic electrical rules, WAC 296-800-280 means:

- Underground installations or in concrete slabs or masonry that are in direct contact with the earth
- Locations that can be saturated by water or other liquids
- Unprotected locations exposed to the weather (like vehicle washing areas)

**WISHA**

This is an acronym for the Washington Industrial Safety and Health Act.

**Work area**

As used in employer chemical hazard communication, WAC 296-800-170, a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

**Working days**

Means a calendar day, except Saturdays, Sundays, and legal holidays. Legal holidays include:

- New Year's Day - January 1
- Martin Luther King, Jr. Day
- Presidents' Day
- Memorial Day
- Independence Day - July 4
- Labor Day
- Veterans' Day - November 11
- Thanksgiving Day
- The day after Thanksgiving Day; and
- Christmas Day - December 25

The number of working days must be calculated by not counting the first working day and counting the last working day.

**Worker**

See the definition for employee.

**Workplace**

• The term workplace means:

- Any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control, and includes, but is not limited to, all workplaces covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

- As used in Employer Chemical Hazard Communication, WAC 296-800-170 means an establishment, job site, or project, at one geographical location containing one or more work areas.

**You**

See definition of employer.

**Your representative**

Your representative is the person selected to act in your behalf.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-18-090, § 296-800-370, filed 9/2/03, effective 11/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-16-047, § 296-800-370, filed 8/1/02, effective 10/1/02; 01-23-060, § 296-800-370, filed 11/20/01, effective 12/1/01; 01-11-038, § 296-800-370, filed 5/9/01, effective 9/1/01.]

**Chapter 296-802 WAC****EMPLOYEE MEDICAL AND EXPOSURE RECORDS****WAC**

296-802-100	Scope.
296-802-200	Keep employee medical and exposure records.
296-802-20005	Keep employee medical records.
296-802-20010	Keep employee exposure records.
296-802-20015	Keep analyses of medical or exposure records.
296-802-300	Inform employees about records.
296-802-30005	Inform current employees about their medical and exposure records.
296-802-400	Provide employees access to records and analyses.
296-802-40005	Provide access to employee medical records, exposure records, and analyses.
296-802-40010	Provide employee medical records.
296-802-40015	Provide employee exposure records.
296-802-500	Respond to medical record access orders.
296-802-50005	Respond to WISHA access orders for employee medical records.
296-802-50010	Content of WISHA written access orders.
296-802-600	Transfer and disposal of employee records.
296-802-60005	Transfer or dispose of employee medical and exposure records when you go out of business.
296-802-900	Definitions.

**WAC 296-802-100 Scope.** The purpose of this chapter is to provide employees and their designated representatives the right to access relevant medical and exposure records. It also describes the procedures WISHA will follow when accessing confidential medical information.

**This chapter applies to:**

- All employers who make, maintain, contract for, or have access to records relating to employee exposure to toxic substances or harmful physical agents, whether or not they are required by specific occupational safety and health rules. These records include:

- Employee medical records.
- Employee exposure records.
- Analyses of employee medical or exposure records.

**IMPORTANT:**

- The requirements of this chapter do not affect any other legal and ethical obligations the employer has to keep employee medical information confidential.

**Exemption:** Agricultural operations covered by chapter 296-307 WAC, Safety standards for agriculture, are exempt from the requirements of this chapter.

**Reference:**

- Requirements for material safety data sheets are found in WAC 296-800-180, Material safety data sheets (MSDSs) as exposure records.
- Additional information about accessing medical information can be found in chapter 70.02 RCW, Medical record—Health care information access and disclosure.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-802-100, filed 4/27/04, effective 8/1/04.]

[Title 296 WAC—p. 2740]

**WAC 296-802-200 Keep employee medical and exposure records.****Summary:****Your responsibility:**

To keep employee medical records, exposure records, and analyses.

**IMPORTANT:**

- Physicians or other health care personnel may keep medical records for you.
- You may keep information in any form as long as the information is retrievable.
- Unless a specific occupational safety and health rule provides a different time period, you must keep records for the period required by this chapter.

**You must:**

Keep employee medical records

WAC 296-802-20005.

Keep employee exposure records

WAC 296-802-20010.

Keep analyses of medical or exposure records

WAC 296-802-20015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-802-200, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-20005 Keep employee medical records.****You must:**

- Keep medical records for at least as long as the employee works for you plus thirty years.

**Exemption:**

- If an employee works for you for less than **one** year and you provide the records to them when they leave employment, you do not have to keep their medical records.
- You do not need to keep the following records for any specific period:
  - Health insurance claims records maintained separately from your medical program and records.
  - Records of first-aid treatment, if made on-site by a nonphysician and if kept separately from the employee medical record.

**You must:**

- Keep chest X-ray films in their original state, such as film or electronic image.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-802-20005, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-20010 Keep employee exposure records.****IMPORTANT:**

You do not need to keep employee exposure records for exposure to toxic substances when they are:

- Purchased as a consumer product;

**AND**

- Used in the same manner and frequency that a consumer would use them.

**You must:**

- Keep employee exposure records for at least thirty years from the date the exposure record was made. These records include the following:
  - The sampling results.
  - The collection methodology (sampling plan).
  - A description of the analytical and mathematical methods used.

– Background data to environmental monitoring or measuring, such as laboratory reports and work sheets.

**Note:** You do not have to keep the actual background data for more than one year if you keep a summary of the data for thirty years.

**You must:**

Keep a record, for at least thirty years, of the identity of any toxic substance used in your workplace. Include:

- Where the substance was used.
- When the substance was used.

**Note:** The identity may be retained either as part of the exposure record or as a separate record.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-20010, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-20015 Keep analyses of medical or exposure records.**

**You must:**

• Keep each analysis using medical or exposure records for at least thirty years.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-20015, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-300 Inform employees about records.**

**Summary:**

**Your responsibility:**

To inform current employees about their medical and exposure records.

**You must:**

Inform current employees about their medical and exposure records

WAC 296-802-30005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-300, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-30005 Inform current employees about their medical and exposure records.**

**You must:**

• Inform employees covered by this rule about medical and exposure records when they first start employment, and then at least annually. Include the following information:

- Where the records are located.
- Who is responsible for the records.
- Who to contact for access to the records.
- Their rights to copy the records.

• Make copies of this rule available upon request to employees.

• Distribute to your employees any information about this chapter that you are given by the department.

**Note:** Some of the ways to inform employees that you have medical and exposure records include e-mail, letters, posters, or classroom training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-30005, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-400 Provide employees access to records and analyses.**

**Summary:**

**Your Responsibility:**

To provide employees access to records and analyses.

(2007 Ed.)

**IMPORTANT:**

• Employees or their designated representatives can use the collective bargaining process to gain access to records beyond what is required by this chapter.

• The requirements of this section apply to both current and former employees.

**You must:**

Provide access to employee medical records, exposure records, and analyses

WAC 296-802-40005.

Provide employee medical records

WAC 296-802-40010.

Provide employee exposure records

WAC 296-802-40015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-400, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-40005 Provide access to employee medical records, exposure records, and analyses.**

**You must:**

• Provide employees and their designated representatives access to requested records and analyses as follows:

- In a reasonable time, place, and manner.
- Within fifteen working days.

■ If there is a delay, inform the requesting party of the reason and the earliest date the record will be made available.

**Exemption:** You do not have to provide analyses that are currently being worked on or have not been reported to you.

**You must:**

• Provide a copy of the record, when requested, to the employee or designated representative without cost. This may be done by one of the following methods:

- Make a copy for the requestor.
- Make the record and a copier available.
- Loan the record to the employee or designated representative for a reasonable time, so a copy can be made.

**Note:** • Access to employee medical records will be provided to designated representatives only when the employee provides specific written authorization. See WAC 296-802-40010.

• To locate or identify the records being requested, you may request, from employees or their designated representatives, only known and necessary information. For example, you may request dates and location of where the employee worked during the time period in question.

• You are not required to perform an analysis of medical or exposure records at the request of an employee or designated representative.

• When there is an original X ray you may restrict access to an on-site examination or make other arrangements for a temporary loan.

• When a record has been provided without cost to an employee or designated representative, and they request additional copies, you may charge a reasonable, nondiscriminatory administrative cost. For example, you may charge search and copying expenses but not overhead expenses.

– A reasonable fee for copying, as defined in chapter 70.02 RCW, should not exceed sixty-five cents per page for the first thirty pages and fifteen cents per page for all additional pages. In addition, a clerical fee for searching and handling may be charged not to exceed fifteen dollars.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-40005, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-40010 Provide employee medical records.****You must:**

• Make sure employees have access, upon request, to their own medical records.

- Note:**
- A physician, nurse, or other responsible health care professional who maintains employee medical records may delete from requested medical records the identity of individuals who provided confidential information regarding an employee's health status.
  - If a physician represents you and believes that providing an employee access to their specific diagnosis of a terminal illness or psychiatric condition could harm the employee, they may request that the record be released only to a designated representative having specific written authorization.
  - The physician representing you may recommend that the employee or designated representative do one of the following:
    - Consult with the physician to review and discuss requested records.
    - Accept a summary of facts and opinions instead of requested records.
    - Accept the release of requested records only to another physician or designated representative.

**You must:**

• Make sure that individual employees are not identified in any portion of analyses that report the contents of employee medical records.

– Identifying information includes both direct identifiers such as name, address, Social Security number, and payroll number, and other information that could reasonably be used in the circumstances to identify individual employees such as exact age, height, or weight.

**Note:** If it is not feasible to remove personal identifying information from a document, you do not have to provide the portions where personal identifiers cannot be moved.

**You must:**

• Provide designated representatives access to employee medical records when the employee provides specific written authorization.

– If the written authorization does not contain an expiration date, it expires ninety days after it is signed.

– Release only medical information that exists on the date of the written employee consent, unless the consent specifically states that future information may be released.

**Note:** An employee may revoke the specific written authorization in writing at any time.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-802-40010, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-40015 Provide employee exposure records.****You must:**

• Provide requested exposure records that show the type and amount of toxic substances or harmful physical agents to which the employee is or has been exposed, for an employee's current or transfer work assignment.

– In the absence of records specific to the employee, exposure records of other employees with the same job duties or related working conditions will be used to the extent necessary to respond to the request.

• Provide a designated representative, who does not have specific employee consent, access to employee exposure records only when a reasonable written request is made that includes the following:

– The records requested.

[Title 296 WAC—p. 2742]

– The occupational health need for accessing these records.

**Note:** Trade secret information may be withheld from exposure records. See chapter 296-816 WAC, Protecting trade secrets, for more information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-802-40015, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-500 Respond to medical record access orders.****Summary:****IMPORTANT:**

This section describes how WISHA accesses employee medical records and your related rights and obligations.

**Your responsibility:**

To post written WISHA access orders.

**You must:**

Respond to WISHA access orders for employee medical records

WAC 296-802-50005.

Content of WISHA written access orders

WAC 296-802-50010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-802-500, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-50005 Respond to WISHA access orders for employee medical records.****You must:**

• Promptly respond to a written access order you receive from WISHA for personally identifiable employee medical information.

• Post a copy of the cover letter you receive from WISHA for fifteen working days where employees can easily review it.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-10-026, § 296-802-50005, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-50010 Content of WISHA written access orders.** A written access order from WISHA will contain at least the following information:

• The identity of employees whose medical information is being requested.

– This may be either by name, job classification, time clock number, department, or similar identifier.

• A description of the medical information that will be examined.

• The purpose for seeking access to this medical information.

– Any additional evidence supporting access to the medical information.

• A step-by-step description of how the records will be obtained, copied, reviewed, and stored, specifying the following:

– Who will be in charge of on-site review of the records, or who will take possession of the records for off-site review.

– Where the records will be reviewed.

– When review or receipt of the records is to take place.

– If the records are to be reviewed on-site, what type of information will be copied and removed off-site.

(2007 Ed.)

- How personal identifiers will be separated from the medical information and how long this information will be kept.

- The principal WISHA investigator's full name, business address and telephone number.

- The full names and titles of all individuals that will review the records.

- The WISHA industrial hygiene program manager's full name, business address and telephone number.

- Note:** WISHA does not need a written access order for the following types of employee medical records:
- Medical records and analyses that do not contain personal identification information.
  - Examination of records to verify compliance with the medical surveillance requirements of another occupational health and safety rule.
  - The following records when required by another occupational health and safety rule:
    - Medical opinions.
    - Biological monitoring results.
    - Results of medical examinations and laboratory tests.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-50010, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-600 Transfer and disposal of employee records.**

**Summary:**

**Your responsibility:**

To transfer or dispose of employee medical and exposure records when you go out of business.

**You must:**

Transfer or dispose of employee medical and exposure records when you go out of business

WAC 296-802-60005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-600, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-60005 Transfer or dispose of employee medical and exposure records when you go out of business.**

**You must:**

- Follow the requirements in Table 1 when transferring or disposing of records.

**Table 1  
Transfer or Disposal of Records**

If	Then
	<p><b>OR</b></p> <ul style="list-style-type: none"> <li>– Transfer the records to WISHA, if required by a specific WISHA safety and health rule</li> </ul>
<p>You intend to dispose of records after the retention period has expired                      Note: If you dispose of records on a regular basis, you may notify WISHA once annually, at least three months before your first disposal, with the schedule of your planned disposals for the year</p>	<ul style="list-style-type: none"> <li>• Do the following:                             <ul style="list-style-type: none"> <li>– Notify WISHA in writing of your impending decision to dispose of records at least three months prior to your planned disposal;</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>– Transfer the records to WISHA, if required by a specific WISHA safety and health rule</li> </ul>

**Note:** The address to notify WISHA in writing is:  
 Department of Labor & Industries/WISHA Services  
 Attention: Medical Records  
 P.O. Box 44610  
 Olympia, WA 98504-4610

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-60005, filed 4/27/04, effective 8/1/04.]

**WAC 296-802-900 Definitions.**

**Access**

The right and opportunity to examine and copy an employee record.

**Analysis using exposure or medical records**

- Any collection of data or a statistical study based on either:
  - Information from individual employee exposure or medical records;

**OR**

- Information collected from health insurance claim records.

**Designated representative**

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written employee authorization.
- The legal representative of a deceased or legally incapacitated employee.

**Employee exposure record**

Means a record containing any of the following kinds of information:

- Environmental (workplace) monitoring or measuring of a toxic substance or harmful physical agent, including personal, area, grab, wipe, or other form of sampling, as well as related collection and analytical methodologies, calculations, and other background data relevant to interpretation of the results obtained.
- Biological monitoring results which directly assess the absorption of a toxic substance or harmful physical agent by body systems (such as the level of a chemical in the blood, urine, breath, hair, or fingernails) but not including results

**Table 1  
Transfer or Disposal of Records**

If	Then
Another employer continues the business when you go out of business	Transfer all employee records to that employer
No other employer continues the business when you go out of business	<p>Do the following:</p> <ul style="list-style-type: none"> <li>– Notify affected current employees of their rights of access to records at least three months prior to the termination of your business</li> </ul> <p><b>AND EITHER:</b></p> <ul style="list-style-type: none"> <li>– Notify WISHA in writing of your impending decision to dispose of records at least three months prior to your planned disposal;</li> </ul>

which assess the biological effect of a substance or agent or which assess an employee's use of alcohol or drugs.

- Material safety data sheets indicating that the material may pose a hazard to human health;

**OR**

- In the absence of the above:

- A chemical inventory or any other record that reveals where and when used and the identity (e.g., chemical, common or trade name) of a toxic substance or harmful physical agent.

- Exposure records of other employees with past or present job duties or related working conditions.

**Employee medical record**

A record concerning the health status of an employee which is made or maintained by a physician, nurse, or other health care personnel, or technician, including:

- Medical and employment questionnaires or histories (including job description and occupational exposures).

- The results of medical examinations (preemployment, preassignment, periodic, or episodic) and laboratory tests (including chest and other X-ray examinations taken for purposes of establishing a baseline or detecting occupational illness, and all biological monitoring not defined as an "employee exposure record").

- Medical opinions, diagnoses, progress notes, and recommendations.

- First-aid records.

- Descriptions of treatments and prescriptions.

- Employee medical complaints.

An employee medical record does **not** include any of these types of medical information:

- Physical specimens (for example, blood or urine samples), which are routinely discarded as a part of normal medical practice.

- Records concerning health insurance claims if maintained separately from the employer's medical program and its records, and not accessible to the employer by employee name or other direct personal identifier, such as Social Security number or payroll number.

- Records created solely in preparation for litigation that are privileged from discovery under applicable rules of procedure or evidence.

- Records concerning voluntary employee assistance programs, such as alcohol, drug abuse, or personal counseling programs, if maintained separately from the employer's medical program and records.

**Exposure or exposed**

The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition. Exposure can occur through various routes, such as inhalation, ingestion, skin contact, or skin absorption.

**First aid**

Any of the following are considered first aid:

- Using a nonprescription medication at nonprescription strength.

- Administering tetanus immunizations. Other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment.

- Cleaning, flushing or soaking wounds on the surface of the skin.

- Using wound coverings such as bandages, Band-Aids™, or gauze pads.

- Using butterfly bandages or Steri-Strips™.

- Using hot or cold therapy.

- Using any nonrigid means of support, such as elastic bandages, wraps, or nonrigid back belts.

- Using temporary immobilization devices, such as splints, slings, neck collars, or back boards, while transporting an accident victim.

- Drilling a fingernail or toenail to relieve pressure.

- Draining fluid from a blister.

- Using eye patches.

- Removing foreign bodies from the eye using only irrigation or a cotton swab.

- Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means.

- Using finger guards.

- Using massages.

- Drinking fluids for relief of heat stress.

**Harmful physical agent**

Any physical stress such as noise, vibration, repetitive motion, heat, cold, ionizing and nonionizing radiation, and hypo- or hyperbaric pressure which:

- Is listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) *Registry of Toxic Effects of Chemical Substances* (RTECS);

**OR**

- Has shown positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer;

**OR**

- Is the subject of a material safety data sheet kept by or known to the employer showing that the material may pose a hazard to human health.

**Health professional**

A physician, occupational health nurse, industrial hygienist, toxicologist, or epidemiologist, who provides medical or other occupational health services to exposed employees.

**Record**

Any item, collection, or grouping of information. Examples include:

- Paper document.

- Microfiche.

- Microfilm.

- X-ray film.

- Computer record.

**Specific chemical identity**

Any other information that reveals the precise chemical designation of the substance, such as:

- Chemical name;

**OR**

- Chemical abstracts service (CAS) registry number.

**Specific written authorization**

A written authorization containing at least the following:

- The name and signature of the employee authorizing the release of medical information.

- The date of the written authorization.

- The name of the individual or organization that is authorized to release the medical information.

- The name of the designated representative (individual or organization) that is authorized to receive the information.
- A general description of the medical information that is authorized to be released.
- A general description of the purpose for the release of the medical information.
- A date or condition upon which the written authorization will expire.

**Toxic substance**

Any chemical substance or biological agent, such as bacteria, virus, and fungus, which is any of the following:

- Listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) *Registry of Toxic Effects of Chemical Substances* (RTECS).
- Shows positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer.
- The subject of a material safety data sheet kept by or known to the employer showing the material may pose a hazard to human health.

**Trade secrets**

Any confidential information that is used in an employer's business and gives an opportunity to gain an advantage over competitors who do not know or use it. It can be a:

- Formula.
- Pattern.
- Process.
- Device.
- Information.
- Collection of information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-10-026, § 296-802-900, filed 4/27/04, effective 8/1/04.]

**Chapter 296-803 WAC  
LOCKOUT/TAGOUT  
(CONTROL OF HAZARDOUS ENERGY)**

**WAC**

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**WAC 296-803-100 Scope.** This chapter applies to the service and maintenance of machines and equipment, including piping systems, if employees could be injured by the:

- Unexpected energization or start up of the machine or equipment;

**OR**

- Release of stored energy.

Energy sources include mechanical, hydraulic, pneumatic, chemical, thermal, or other energy, including gravity.

- Note:**
- Machines and equipment include those that produce high intensity electromagnetic fields.
  - When other Title 296 WAC standards require the use of lockout or tagout, they have to be used and supplemented by the procedural and training requirements of this chapter.

- Exemption:** This chapter does not apply to:
- Construction activities covered by chapter 296-155 WAC, Safety standards for construction work.
  - Agriculture activities covered by chapter 296-307 WAC, Safety standards for agriculture.
  - Maritime activities covered by chapter 296-56 WAC, Safety standards—Longshore, stevedore and related waterfront operations and chapter 296-304 WAC, Safety standards for ship repairing, shipbuilding and shipbreaking.
  - Oil and gas well drilling and servicing.
  - Installations for generating, transmitting, and distributing electrical power (including related communication and metering equipment) that are controlled exclusively by electric utilities.
  - Hot tap operations on pressurized pipelines used to transmit and distribute substances such as gas, steam, water, or petroleum products if the employer can demonstrate that all of the following apply:
    - Continuity of service is essential.
    - Shutdown of the system is impractical.
    - Proven effective employee protection is provided by following documented procedures and using special equipment.
  - Service and maintenance of fire alarm and extinguishing systems and their components if:
    - Other employees depend on these systems for fire safety;
- AND**
- Employees working on fire extinguishing systems are protected from the unexpected release of hazardous energy by appropriate alternative measures.
  - Work on electric equipment receiving power only through a cord and plug if:
    - Unplugging the equipment eliminates the possibility of unexpected energization, unexpected start up, or the release of stored energy;
- AND**
- The plug is kept under the exclusive control of the employee doing the service or maintenance.
  - Exposure to electrical hazards from electrical work on, near, or with conductors or equipment that is covered by chapter 296-24 WAC, General safety and health standards, Part L, Electrical.

- Service and maintenance during normal production operations, if an employee is not required to:
  - Remove or bypass a guard or other safety device;
- OR**
- Place any body part into the point of operation or any other hazardous area created by machine operation.
- Minor tool changes, adjustments, and other minor service during normal production operations if:
  - They are routine, repetitive, and integral to the use of the equipment for production;
- AND**
- The work is done using measures which provide effective protection from hazards.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-100, filed 7/20/04, effective 11/1/04.]

### **WAC 296-803-200 Summary.**

#### **Your responsibility:**

To establish an energy control program.

#### **You must:**

WAC 296-803-20005 Establish a written energy control program.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-803-200, filed 7/20/04, effective 11/1/04.]

### **WAC 296-803-20005 Establish a written energy control program.**

#### **You must:**

- Establish a written energy control program to protect employees that service or maintain a machine or equipment from injury caused by the:
  - Unexpected energization or start up of the machine or equipment;
- OR**
- Release of stored energy.
- Make sure the program contains **all** of the following:
  - Energy control procedures as described in WAC 296-803-500.
  - Employee training as described in WAC 296-803-600.
  - Periodic reviews as described in WAC 296-803-700.
- Develop and document in writing energy control procedures to protect employees doing service or maintenance of a machine or equipment from potentially hazardous energy.

**Exemption:** You do not have to have **written** energy control procedures for a particular machine or equipment if **all** of the following apply:

- The machine or equipment has a single energy source that is easily identified and can be isolated.
- The machine or equipment is completely deenergized and deactivated by isolating and locking out the energy source.
- There's no stored or residual energy that could be a hazard to employees, and the machine or equipment cannot reaccumulate such energy after it's been shut down.
- The energy source can be locked out with a single lockout device.
- The machine or equipment is isolated from the energy source and locked out during service or maintenance.
- The authorized employee doing the service or maintenance has exclusive control of the lockout device.
- The service or maintenance does not create a hazard for other employees.
- The machine or equipment has never been unexpectedly energized or activated during service or maintenance.

#### **You must:**

- Make sure energy control procedures clearly and specifically outline:

- The scope, purpose, authorization, rules, and techniques to control hazardous energy;

#### **AND**

- How you'll make sure employees follow the procedures.

- Make sure energy control procedures specifically identify at least the following:

- When the procedure must be used.
- What the specific procedural steps are for:

- Shutting down, isolating, blocking, and securing the machine or equipment.

- Placing, removing, and transferring lockout or tagout devices and who is responsible for them.

- How to test the machine or equipment to verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

**Note:** Similar machines and equipment may be covered by a single written procedure if **all** of the following apply:

- They use the same type and magnitude of energy.
- They have the same or similar types of controls.
- The specific machines and equipment covered by the procedure are identified by at least type and location.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-803-20005, filed 7/20/04, effective 11/1/04.]

### **WAC 296-803-300 Summary.**

#### **Your responsibility:**

To make sure new or modified machines and equipment can accept lockout devices.

#### **You must:**

WAC 296-803-30005 Make sure new or modified machines and equipment can accept lockout devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-300, filed 7/20/04, effective 11/1/04.]

### **WAC 296-803-30005 Make sure new or modified machines and equipment can accept lockout devices.**

#### **You must:**

- Make sure energy-isolating devices designed to accept a lockout device are provided on machines and equipment that:

- Are newly installed.
- Have major repair.
- Are renovated or modified.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-30005, filed 7/20/04, effective 11/1/04.]

### **WAC 296-803-400 Summary.**

#### **Your responsibility:**

To provide appropriate lockout and tagout devices and means to control energy.

#### **You must:**

WAC 296-803-40005 Provide appropriate means to control energy.

WAC 296-803-40010 Make sure lockout and tagout devices meet these requirements.

WAC 296-803-40015 Make sure lockout devices meet these additional requirements.

WAC 296-803-40020 Make sure tagout devices meet these additional requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-400, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-40005 Provide appropriate means to control energy.****You must:**

• Provide the means necessary to isolate, secure, or block machines and equipment from energy sources.

**Note:** Examples of means to control energy include:

- Locks.
- Tags.
- Chains.
- Wedges.
- Key blocks.
- Adapter pins.
- Self-locking fasteners.
- Blind flanges.
- Cribbing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-40005, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-40010 Make sure lockout and tagout devices meet these requirements.****You must:**

• Make sure lockout and tagout devices meet all of the following:

- Create **no** additional hazards.
- Have a distinctive design or appearance.
- Are the only devices used for controlling energy.
- Are **not** used for any other purpose.
- Are durable enough to withstand the environment they're used in for the maximum time they're expected to be used.
- Are standardized within the facility by color, shape, or size.
- Identify the person applying the device.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-40010, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-40015 Make sure lockout devices meet these additional requirements.****You must:**

• Make sure lockout devices are strong enough so that removing them by other than the normal unlocking method requires:

- Excessive force;

**OR**

– Unusual techniques such as the use of bolt cutters or other metal-cutting tools.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-40015, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-40020 Make sure tagout devices meet these additional requirements.****You must:**

- Make sure all tags:
  - Use the same print and format within a facility.
  - Are constructed and printed so they will not deteriorate and the message on the tag remains legible when:
    - Exposed to weather.
    - Used in wet or damp locations.
    - Used in corrosive environments such as areas where acid or alkali chemicals are handled or stored.
  - Have a warning about **not** energizing the machine or equipment.

(2007 Ed.)

**Note:** The warning on the tag should include wording such as:

- Do not start.
- Do not open.
- Do not close.
- Do not energize.
- Do not operate.

**You must:**

- Make sure tagout devices are strong enough to prevent unintentional or accidental removal.
  - Make sure the means used to attach the tag to the energy-isolating device meets all of the following:
    - Is not reusable.
    - Is self-locking.
    - Can be attached by hand.
    - Cannot be released with a force of less than fifty pounds.
    - Is similar in design and basic characteristics to a one-piece, all-environment-tolerant, nylon cable tie.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-40020, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-500 Summary.****Your responsibility:**

To make sure energy control procedures are used and include these requirements.

**You must:****ENERGY CONTROL PROCEDURES**

WAC 296-803-50005 Use energy control procedures.

**APPLYING LOCKOUT OR TAGOUT DEVICES**

WAC 296-803-50010 Meet these requirements when applying lockout or tagout devices.

WAC 296-803-50015 Meet these additional requirements when applying lockout devices.

WAC 296-803-50020 Meet these additional requirements when applying tagout devices.

**STORED ENERGY**

WAC 296-803-50025 Protect employees from the hazards of stored and residual energy.

**VERIFYING MACHINE ISOLATION**

WAC 296-803-50030 Verify that the machine or equipment is safe before starting work.

**REMOVING ENERGY CONTROL DEVICES**

WAC 296-803-50035 Meet these requirements when removing lockout or tagout devices and energizing the machine or equipment.

**TEMPORARY ENERGIZATION**

WAC 296-803-50040 Meet these requirements if it's necessary to temporarily energize a machine, equipment, or component for testing or positioning.

**SHIFT OR PERSONNEL CHANGES**

WAC 296-803-50045 Protect employees during shift or personnel changes.

**GROUP LOCKOUT/TAGOUT**

WAC 296-803-50050 Protect employees working in a group.

WAC 296-803-50055 Meet these additional requirements if more than one group is used.

**OUTSIDE EMPLOYEES**

WAC 296-803-50060 Coordinate with outside employers servicing or maintaining your machines or equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-500, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50005 Use energy control procedures.****You must:**

- Use energy control procedures to protect employees servicing or maintaining machines and equipment from potentially hazardous energy.
- Use a lockout system if an energy-isolating device can be locked out.

**Exemption:** A tagout system may be used instead of a lockout system if it meets **all** of the following:

- The tagout device is attached where you would have put the lockout device.
- The tagout system provides the same level of employee protection as a lockout system.
- You can demonstrate that the tagout system:
  - Meets all tagout requirements of this chapter.
  - Includes additional safety measures to provide the same level of safety as a lockout system.

**Note:** Additional safety measures used with the tagout system to provide protection equal to a lockout system could include actions such as:

- Removing part of the isolating circuit.
- Blocking a controlling switch.
- Opening an extra disconnecting device.
- Removing a valve handle.

**You must:**

- Use a tagout system if an energy-isolating device cannot be locked out.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50005, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50010 Meet these requirements when applying lockout or tagout devices.****You must:**

- Make sure, before a machine or equipment is turned off, that the authorized employee knows **all** of the following:
  - Type and magnitude of the energy.
  - Hazards of the energy to be controlled.
  - Method or means to control the energy.
- Turn off or shut down the machine or equipment using established procedures.
  - Completely isolate the machine or equipment from its energy sources using the appropriate energy-isolating devices after the machine or equipment has been turned off.
  - Make sure you or the authorized employee notify affected employees that the machine or equipment is being locked or tagged out before the devices are applied.
    - Make sure a lockout or tagout device is applied:
      - For each energy-isolating device.
      - Only by the authorized employee doing the service or maintenance.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50010, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50015 Meet these additional requirements when applying lockout devices.****You must:**

- Make sure lockout devices hold the energy-isolating device in a "safe" or "off" position.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50015, filed 7/20/04, effective 11/1/04.]

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**WAC 296-803-50020 Meet these additional requirements when applying tagout devices.****You must:**

- Make sure a tagout device is put on an energy-isolating device so it clearly shows that moving the energy-isolating device from the "safe" or "off" position is prohibited.
  - Make sure a tagout device, when used with an energy-isolating device that can be locked out, is fastened to the device at the same point a lock would have been attached.
    - Make sure a tagout device that cannot be attached directly to an energy-isolating device is located:
      - As close as safely possible to the energy-isolating device;

**AND**

- In a position that is immediately obvious to anyone attempting to operate the energy-isolating device.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50020, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50025 Protect employees from the hazards of stored and residual energy.****You must:**

- Make sure all potentially hazardous stored and residual energy is relieved, disconnected, restrained, or otherwise rendered safe after the lockout or tagout devices have been put on the energy-isolating devices.

- Continue to verify the isolation of machines and equipment that could reaccumulate stored energy to a hazardous level until:
  - Service or maintenance is completed;

**OR**

- The possibility of reaccumulating hazardous energy does not exist.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50025, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50030 Verify that the machine or equipment is safe before starting work.****You must:**

- Make sure the authorized employee verifies that the machine or equipment that's been locked out or tagged out has been isolated from all energy sources and deenergized before starting work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50030, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50035 Meet these requirements when removing lockout or tagout devices and energizing the machine or equipment.****You must:**

- Make sure the authorized employee does the following before removing any lockout or tagout device:
  - Inspects the work area to make sure nonessential items have been removed;
  - Verifies the machine or equipment is in operating condition and ready to energize;

**AND**

- Check that employees in the area are in positions that make it safe to energize the machine or equipment.

- Make sure only the authorized employee who applied a lockout or tagout device removes it.

**Exemption:** The employer may have the lockout or tagout device removed by someone other than the authorized employee who applied it if **all** of the following conditions are met:

- The energy control program has documented, specific procedures and training for this situation.
- You can show that the specific procedures used are as safe as having the device removed by the authorized employee who applied it.
- The specific procedures include at least the following:
  - Verifying the authorized employee who applied the device is not at the facility.
  - Making all reasonable efforts to contact and inform the authorized employee that the lockout or tagout device is being removed.
  - Making sure the authorized employee is informed, before resuming work at the facility, that the lockout or tagout device has been removed.

**You must:**

- Do the following before energizing or starting the machine or equipment:
  - Notify affected employees that the lockout or tagout devices have been removed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50035, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50040 Meet these requirements if it's necessary to temporarily energize a machine, equipment, or component for testing or positioning.**

**You must:**

- Follow your normal energy control procedures to:
  - Remove the lockout or tagout devices.
  - Energize the machine, equipment, or component.
  - Reapply the lockout or tagout devices when testing or positioning is completed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50040, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50045 Protect employees during shift or personnel changes.**

**You must:**

- Use specific procedures for shift or personnel changes to:
  - Make sure there's continuous lockout or tagout protection during the change;

**AND**

- Provide for the orderly transfer of lockout or tagout device protection between employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50045, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50050 Protect employees working in a group.**

**You must:**

- Make sure your energy control procedures provide each member of a crew, craft, department, or other group with the same level of protection as that provided by an individual lockout or tagout device.
- Make sure each authorized employee:
  - Puts a personal lockout or tagout device on the group lockout device, lockbox, or comparable mechanism before beginning work;

**AND**

- Does **not** remove it until they have finished work on the machine or equipment.

(2007 Ed.)

- Assign a primary authorized employee who:
  - Has overall responsibility for the service or maintenance;
  - Attaches their lockout or tagout device to the energy-isolating device when the equipment is deenergized and before any work begins;

**AND**

- Is the last person to remove their lockout or tagout device when the job is completed.

**Definition:**

The *primary authorized employee* is the authorized employee who has overall responsibility for meeting the requirements of the lockout/tagout procedures.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50050, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50055 Meet these additional requirements if more than one group is used.**

**You must:**

- Do **all** of the following if more than one group works on a machine or equipment that has to be locked or tagged out:
  - Assign an authorized employee as the group coordinator with overall responsibility to:
    - Coordinate the different work groups;

**AND**

- Assign a primary authorized employee in each group who has:
  - Responsibility for the group of employees who are protected by a group lockout or tagout device;

**AND**

- A way to determine which employees of the group are exposed to the machine or equipment that's locked or tagged out.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50055, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-50060 Coordinate with outside employers servicing or maintaining your machines or equipment.**

**You must:**

- Do the following before allowing another employer's personnel to service or maintain machines or equipment if your energy control procedures require they be locked or tagged out:
  - Inform the outside employer of your lockout or tagout procedures.

- Make sure the outside employer informs you of their lockout or tagout procedures.
- Make sure you and the outside employer confirm that all employees understand and will follow the restrictions of the other employer's energy control program.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-50060, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-600 Summary.**

**Your responsibility:**

To train employees on your energy control program.

**You must:**

WAC 296-803-60005 Provide and document employee training on the energy control program.

WAC 296-803-60010 Provide additional training if you use tagout devices.

WAC 296-803-60015 Retrain employees when necessary.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-803-600, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-60005 Provide and document employee training on the energy control program.****You must:**

- Train employees to make sure that they:
  - Understand the purpose and function of the energy control program;

**AND**

– Have the knowledge and skills necessary to carry out their program responsibilities.

- Train each authorized employee in:

– The type and magnitude of energy available in the workplace.

– Recognizing hazardous energy sources that apply.

– Methods and means to isolate and control energy.

• Instruct each affected employee in the purpose and use of the energy control procedures.

• Instruct all employees who work or may work where energy control procedures might be used about the:

– Procedures being used;

**AND**

– Prohibition against attempting to restart or reenergize a machine or equipment that's locked out or tagged out.

• Document that employee training has been done and kept up to date.

– Include the employee's name and the training date.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-803-60005, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-60010 Provide additional training if you use tagout devices.****You must:**

- Make sure employees are trained in the following:

– Tags are warning devices and do not provide the same level of physical restraint as a lock.

– When attached to energy-isolating devices, tags are not to be:

■ Removed without the approval of the authorized person responsible for it;

**OR**

- Bypassed, ignored, or otherwise defeated.

– Tags need to be legible and understandable to be effective.

– Tags may evoke a false sense of security.

– The meaning of tags needs to be understood as part of the overall energy control program.

– Tags and their means of attachment must be:

■ Securely attached to energy-isolating devices so they cannot be inadvertently or accidentally detached;

**AND**

■ Made of materials that will withstand the environmental conditions they will be exposed to.

[Title 296 WAC—p. 2750]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-803-60010, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-60015 Retrain employees when necessary.****You must:**

• Retrain authorized and affected employees to introduce new or revised control methods and procedures when there's a change in **any** of the following:

– Job assignments.

– Machines, equipment, or processes that present a new hazard.

– Energy control procedures.

- Retrain employees to reestablish proficiency when:

– A periodic inspection shows the employee deviates from, or has inadequate knowledge of, the energy control procedures;

**OR**

– The employer has reason to believe retraining is necessary.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-803-60015, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-700 Summary.****Your responsibility:**

To do periodic reviews to make sure employees know and use your energy control procedures.

**You must:**

WAC 296-803-70005 Perform and document periodic reviews to verify employees know and follow the energy control procedures.

WAC 296-803-70010 Do periodic reviews of procedures using lockout devices.

WAC 296-803-70015 Do periodic reviews of procedures using tagout devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-15-105, § 296-803-700, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-70005 Perform and document periodic reviews to verify employees know and follow the energy control procedures.****You must:**

- Do a periodic review at least annually to:

– Make sure employees know and can apply the energy control procedures.

– Correct any deviations or inadequacies identified.

**Exemption:** Energy control procedures used less frequently than once a year only need to be reviewed before being used.

**You must:**

• Have the periodic review done by an authorized employee other than the ones using the energy control procedure being reviewed.

- Document that periodic reviews have been done.

– Include all of the following:

■ Machine or equipment the energy control procedure was used for.

■ Date of the review.

■ Employees included in the review.

■ Person doing the review.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-70005, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-70010 Do periodic reviews of procedures using lockout devices.**

**You must:**

- Make sure, if a periodic review involves lockout devices, the reviewing employee reviews responsibilities with each authorized employee who uses the procedure.

**Note:** Periodic reviews of authorized employees using energy control procedures involving only lockout devices can be done in a group meeting if desired.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-70010, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-70015 Do periodic reviews of procedures using tagout devices.**

**You must:**

- Make sure, if a periodic review involves tagout devices, the reviewing employee reviews with each authorized and affected employee the:

- Employee's responsibilities under the procedure;

**AND**

- Limitations of tagout devices.

**Note:** Periodic reviews of authorized and affected employees using energy control procedures involving tagout devices have to be done with each employee individually.

**Reference:** See WAC 296-803-60010, Provide additional training if you use tagout devices, in this chapter for the limitations of tagout devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-70015, filed 7/20/04, effective 11/1/04.]

**WAC 296-803-800 Definitions.**

**Affected employee.** An employee who's required to operate, use, or be in the area where a machine or equipment could be locked or tagged out for service or maintenance.

**Authorized employee.** An employee who locks or tags out a machine or equipment to do service or maintenance.

**Can be locked out.** An energy-isolating device that can be locked in the "off" or "safe" position.

**Employer.** Based on chapter 49.17 RCW, an employer is any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: Provided, That any persons, partnership, or business entity not having employees, and who is covered by the Industrial Insurance Act must be considered both an employer and an employee.

**Energized.** Connected to an energy source or containing residual or stored energy.

**Energy-isolating device.** A mechanical device that physically prevents transmitting or releasing energy. This includes, but is not limited to:

- Manually operated electrical circuit breakers.
- Disconnect switches.

- Manually operated switches that disconnect the conductors of a circuit from all ungrounded supply conductors if no pole of the switch can be operated independently.

- Line valves.

- Blocks.

- Similar devices used to block or isolate energy.

**Energy source.** Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy, including gravity.

**Hot tap.** A procedure which involves welding on pressurized pipelines, vessels, or tanks to install connections or accessories. It's commonly used to replace or add sections of pipeline used in air, gas, water, steam, and petrochemical distribution systems without interrupting service.

**Lockout.** Placing a lockout device on an energy-isolating device using an established procedure to make sure the machine or equipment cannot be operated until the lockout device is removed.

**Lockout device.** A device that uses a positive means, such as a key or combination lock, to hold an energy-isolating device in the "safe" or "off" position. This includes blank flanges and bolted slip blinds.

**Normal production operations.** Using a machine or equipment for its intended production function.

**Primary authorized employee.** An authorized employee who has overall responsibility for meeting the requirements of the lockout/tagout procedures.

**Service and maintenance.** Activities such as constructing, installing, setting-up, adjusting, modifying, maintaining, and servicing machines or equipment. It also includes lubricating, cleaning, unjamming, and making tool changes.

**Setting-up.** Work done to prepare a machine or equipment for normal production operations.

**Tagout.** Placing a tagout device on an energy-isolating device using an established procedure to indicate that the energy-isolating device and the machine or equipment being controlled may not be operated until the tagout device is removed.

**Tagout device.** A prominent warning device, such as a tag and a means of attachment. It can be securely fastened to an energy-isolating device to indicate that the energy-isolating device and the machine or equipment being controlled may not be operated until the tagout device is removed.

**You.** See definition of employer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-15-105, § 296-803-800, filed 7/20/04, effective 11/1/04.]

**Chapter 296-806 WAC  
MACHINE SAFETY**

**WAC**

296-806-100 Scope.

**REQUIREMENTS FOR ALL MACHINES**

296-806-200 Summary.

**WORKPLACE**

296-806-20002 Secure machines designed to stay in one place.

296-806-20004 Protect employees from slipping hazards around machinery.

296-806-20006 Arrange work areas to avoid creating hazards.

**MACHINE CONTROLS AND OPERATIONS**

296-806-20008 Make sure operating controls meet these requirements.

296-806-20010	Protect employees from unintentional machine operation.	296-806-40504	Make sure machines have safety guards.
296-806-20012	Make sure emergency stop controls meet these requirements.	296-806-40506	Make sure safety guards meet specific requirements.
296-806-20014	Control machine vibration.	296-806-40508	Provide a tongue guard on bench, pedestal, floorstand, and cylindrical grinders.
296-806-20016	Prevent overspeed conditions.	296-806-40510	Use a work rest for off-hand grinding.
296-806-20018	Make sure hand feeding and retrieval tools meet these requirements.	296-806-40512	Make sure abrasive wheels are safe to use.
296-806-20020	Protect employees who are adjusting or repairing machinery.	296-806-40514	Mount wheels properly.
	<b>POWER TRANSMISSION PARTS</b>	296-806-40516	Use proper flanges.
296-806-20022	Keep power transmission equipment in good working condition.	296-806-40518	Make sure flanges are in good condition.
296-806-20024	Inspect power transmission parts.	296-806-40520	Use specific flanges for Type 1 cutting-off wheels.
296-806-20026	Protect employees lubricating moving machinery.	296-806-40522	Use specific flanges for Type 27A cutting-off wheels.
	<b>SAFEGUARDING REQUIREMENTS</b>	296-806-40524	Use blotters when required.
296-806-20028	Safeguard employees from the point of operation.	296-806-40526	Meet specific blotter requirements when using modified Types 6 and 11 wheels (terrazzo).
296-806-20030	Safeguard employees from nip or shear point hazards.		<b>Calenders</b>
296-806-20032	Safeguard employees from rotating or revolving parts.	296-806-410	Summary.
296-806-20034	Safeguard employees from reciprocating or other moving parts.	296-806-41002	Provide calender safety controls.
296-806-20036	Safeguard employees from flying objects.	296-806-41004	Follow these stopping limit requirements for calenders.
296-806-20038	Safeguard employees from falling objects.		<b>COMPACTORS</b>
296-806-20040	Safeguard employees from moving surfaces with hazards.	296-806-415	Summary.
	<b>SAFEGUARDING METHODS</b>	296-806-41502	Safeguard hazardous moving parts of stationary compactors.
	Guards	296-806-41504	Follow these requirements for compactor controls.
296-806-20042	Make sure guards meet these requirements.	296-806-41506	Follow these requirements for compactor access doors and covers.
	<b>DEVICES</b>	296-806-41508	Follow these requirements for compactors that cycle automatically.
296-806-20044	Make sure devices meet these requirements.		<b>CONVEYORS</b>
296-806-20046	Make sure light curtains meet these requirements.	296-806-420	Summary.
296-806-20048	Make sure pressure-sensitive mats meet these requirements.		<b>GENERAL REQUIREMENTS FOR CONVEYORS</b>
296-806-20050	Make sure restraint or pullback devices meet these requirements.	296-806-42002	Follow these requirements for conveyors.
296-806-20052	Make sure two-hand devices meet these requirements.	296-806-42004	Provide emergency stops on conveyors.
296-806-20054	Make sure devices used with barrier guards meet these requirements.	296-806-42006	Label conveyor controls.
	<b>DISTANCE</b>	296-806-42008	Prohibit riding on conveyors.
296-806-20056	Make sure safeguarding by distance meets these requirements.	296-806-42010	Provide safe access to conveyors.
296-806-20058	Make sure guardrails used for safeguarding meet these requirements.	296-806-42012	Provide backstop or antirunaway devices on incline, decline, or vertical conveyors.
	<b>REQUIREMENTS FOR SPECIFIC MACHINE HAZARDS</b>	296-806-42014	Make only safe alterations to conveyors.
296-806-30002	Fit arbors and mandrels to the machine.	296-806-42016	Inspect and replace worn conveyor parts.
296-806-30004	Safeguard belt and rope drives.	296-806-42018	Follow these requirements for replacing conveyor parts.
296-806-30006	Make sure belt or rope drives meet these requirements.	296-806-42020	Follow these requirements for spill guards.
296-806-30008	Protect employees while shifting belts on belt and pulley drives.	296-806-42022	Provide pedestrian overpasses for conveyors.
296-806-30010	Make sure belt tighteners meet these requirements.	296-806-42024	Guard openings to hoppers and chutes.
296-806-30012	Safeguard cams, connecting rods, tail rods, and extension piston rods.	296-806-42026	Install guideposts.
296-806-30014	Safeguard chain and sprocket drives.		<b>BELT CONVEYORS</b>
296-806-30016	Safeguard fan blades.	296-806-42028	Guard nip points on belt conveyors.
	<b>FLYWHEELS</b>	296-806-42030	Install emergency stop controllers on overland belt conveyors.
296-806-30018	Safeguard flywheels.	296-806-42032	Install belt conveyor overpasses.
296-806-30020	Safeguard gears.		<b>CHAIN CONVEYORS</b>
296-806-30022	Safeguard projections on moving parts.	296-806-42034	Safeguard chain conveyors.
296-806-30024	Safeguard pulleys.	296-806-42036	Guard return strands on chain conveyors.
296-806-30026	Make sure pulleys meet these requirements.	296-806-42038	Guard chain conveyors that are used as a transfer mechanism.
296-806-30028	Safeguard revolving drums, barrels, and containers.		<b>ELEVATOR CONVEYORS</b>
296-806-30030	Safeguard shafting.	296-806-42040	Prevent material from falling off of elevator conveyors.
296-806-30032	Make sure shafting meets these requirements.		<b>INCLINED RECIPROCATING CONVEYORS (SHAKERS)</b>
296-806-30034	Safeguard unused keyways.	296-806-42042	Provide protection where employees must load shakers.
296-806-30036	Make sure revolving collars meet these requirements.	296-806-42044	Provide grating over silo and bunker openings for shuttle conveyors.
296-806-30038	Safeguard counterweights.		<b>MOBILE CONVEYORS</b>
	<b>ADDITIONAL REQUIREMENTS FOR SOME MACHINES AND MACHINE OPERATIONS</b>	296-806-42046	Guard wheels and rails on mobile conveyors.
296-806-400	Summary.	296-806-42048	Prevent hazardous motion on mobile conveyors.
	<b>ABRASIVE WHEELS</b>	296-806-42050	Provide a detector for mobile conveyors.
296-806-405	Summary.	296-806-42052	Provide safe access on mobile conveyors.
296-806-40502	Make sure abrasive wheels and machines are properly designed and constructed.	296-806-42054	<b>PUSHER-BAR CONVEYORS</b>
			Guard pusher-bar conveyors.
			<b>ROLLER CONVEYORS</b>
		296-806-42056	Prohibit walking on roller-type conveyors.
		296-806-42058	Use speed controls for roller and wheel conveyors.

296-806-42060	Safeguard belt-driven live roller conveyors. SCREW CONVEYORS	296-806-42580 296-806-42582 296-806-42584	Safeguard box and roll-type dough sheeters. Provide proper enclosures for sifters. Follow these requirements for sugar and spice pulverizers.
296-806-42062	Guard screw conveyors. SKIP HOISTS		FORGING MACHINES
296-806-42064 296-806-42066 296-806-42068	Provide slack-cable switches on hoists. Block the skip bucket and counterweight guides. Protect against wire rope coming off sheaves.	296-806-430	Summary.
	SLAT AND ROLLER-SLAT CONVEYORS		GENERAL REQUIREMENTS FOR FORGING
296-806-42070	Safeguard slat and roller-slat conveyors. TOWED CONVEYORS	296-806-43002	Follow these safety requirements when using lead and lead casts.
296-806-42072 296-806-42074	Provide a safe method for disengaging the tow pin. Protect employees from moving carts on towed conveyors.	296-806-43004 296-806-43006 296-806-43008 296-806-43010 296-806-43012 296-806-43014	Properly inspect and maintain forging equipment. Use safety blocks on hammers and presses. Make sure tongs meet these requirements. Protect employees when removing scale. Provide adequate foundations for hammers and presses. Follow these requirements for manually operated valves and switches.
296-806-42076	Provide clearances and warnings for carts on towed conveyors.		HAMMERS
296-806-42078	Mark projections above the floor. FOOD PROCESSING EQUIPMENT		
296-806-425	Summary. FACILITIES		
296-806-42502	Provide locks on chamber doors of large air conditioning units.	296-806-43016 296-806-43018 296-806-43020 296-806-43022 296-806-43024 296-806-43026	Use die keys and shims made of proper-grade material. Provide a safety cylinder head. Provide a shutoff valve. Provide a means for cylinder draining. Follow these requirements for pressure pipes. Follow these requirements when using board hammers.
296-806-42504 296-806-42506 296-806-42508 296-806-42510	Use proper door locks on rack-type bread coolers. Provide see-through panels on fermentation room doors. Cover exposed hot pipes. Provide extension piping on stationary lubrication fittings.		OTHER FORGE FACILITY EQUIPMENT
296-806-42512 296-806-42514 296-806-42516	Provide hoods for pan-washing tanks. Safeguard proof boxes. Safeguard storage bins.	296-806-43028	Protect against sparks from saws.
	MATERIAL HANDLING		GARBAGE (WASTE) DISPOSALS
296-806-42518	Follow these design requirements for bag lifts (bag arm elevators) and chutes.	296-806-435 296-806-43502	Summary. Safeguard garbage (waste) disposal equipment.
296-806-42520 296-806-42522 296-806-42524	Follow these requirements for chain tackle. Safeguard conveyors. Use properly designed covers for screw conveyors (augers).		GLUE SPREADERS
296-806-42526	Safeguard pallet jacks and hand trucks.	296-806-440 296-806-44002	Summary. Provide guards and automatic shutoffs on glue spreaders.
	SPECIFIC FOOD PROCESSING EQUIPMENT		IRONWORKERS
296-806-42528 296-806-42530 296-806-42532 296-806-42534	Safeguard bakery slicers. Safeguard bakery wrapping machines. Provide troughs with antifriction-bearing casters. Follow these requirements for trough hoists and similar equipment.	296-806-445 296-806-44502 296-806-44504	Summary. Safeguard ironworkers point of operation. Follow these requirements for adjustable restrictors when safeguarding ironworkers.
296-806-42536 296-806-42538 296-806-42540	Follow these requirements for dividers. Safeguard manually-fed dough and cross-roll brakes. Provide a guard or tripping device on reversible dough brakes.		LATHES
296-806-42542 296-806-42544 296-806-42546 296-806-42548	Follow these requirements for doughnut machines. Follow these requirements for dumpbins and blenders. Follow these requirements for flour-handling machines. Follow these requirements for traveling or track-type flour scales.	296-806-450 296-806-45002	Summary. METAL LATHES
296-806-42550 296-806-42552	Follow these requirements for food grinders and cutters. Provide covers with interlocks on ingredient premixers, emulsifiers, and similar machines.	296-806-45004 296-806-45006 296-806-45008 296-806-45010	Provide shields or guards on metal lathes for chip or coolant hazards. Safeguard work-holding devices (chucks). Follow these requirements for chip control and handling. Safeguard power-clamping devices. Restrain extended workpieces on horizontal lathes.
296-806-42554 296-806-42556 296-806-42558	Follow these requirements for open fat kettles. Follow these requirements for steam kettles. Follow these requirements for chocolate melting, refining, and mixing kettles.		WOODWORKING LATHES
296-806-42560	Safeguard meat-processing equipment (circular meat-cutting saws).	296-806-45012	Guard cutting heads on profile lathes and swing-head lathes.
296-806-42562 296-806-42564 296-806-42566	Follow these requirements for horizontal dough mixers. Follow these requirements for vertical mixers. Follow these requirements for mechanical-feed moulders.	296-806-45014 296-806-45016 296-806-45018	Guard cutting heads on turning lathes. Guard automatic turning lathes. Guard wood lathes used for turning long pieces of stock.
296-806-42568 296-806-42570	Follow these requirements for hand-fed moulders. Design, install, and construct your ovens according to these requirements.		MECHANICAL POWER PRESSES
296-806-42572	Properly locate emergency "stop" buttons and main shut off valves for ovens.	296-806-455	Summary.
296-806-42574 296-806-42576 296-806-42578	Inspect and test safety devices on ovens. Follow these requirements for peanut-cooling trucks. Follow these requirements for pretzel-rolling, pretzel stick extruding, rotary, and die machines.	296-806-45502	DESIGN AND CONSTRUCTION
			SAFEGUARDING
		296-806-45504 296-806-45506 296-806-45508 296-806-45510	Safeguard presses that use unitized tooling. Protect operators from guidepost hazards. Safeguard the point of operation. Make sure point-of-operation guards are properly designed and constructed.
		296-806-45512 296-806-45514 296-806-45516	Make sure barrier guards meet these requirements. Make sure point-of-operation devices are effective. Make sure presence-sensing devices used to safeguard the point of operation meet these requirements.

296-806-45518	Make sure pull-back devices used to safeguard the point of operation meet these requirements.	296-806-48016	Safeguard self-feed circular saws.
296-806-45520	Make sure restraint (holdout) devices used to safeguard the point of operation meet these requirements.	296-806-48018	Provide kickback protection for self-feed circular rip-saws when ripping wood products.
296-806-45522	Make sure two-hand control devices used to safeguard the point of operation meet these requirements.	296-806-48020	Guard circular resaws.
296-806-45524	Make sure two-hand trip devices used to safeguard the point of operation meet these requirements.	296-806-48022	Provide spreaders for circular resaws.
296-806-45526	Provide additional safeguards when the operator puts one or both hands into the point of operation.		Requirements for Specific Circular Saws
	OPERATIONS	296-806-48024	Protect employees from automatic saw hazards.
296-806-45528	Establish die setting procedures.	296-806-48026	Guard inverted swing (jump) saws.
296-806-45530	Handle dies safely.	296-806-48028	Guard miter saws.
296-806-45532	Protect die setters during setup and tryout.	296-806-48030	Guard radial saws.
296-806-45534	Train press operators.	296-806-48032	Limit the travel of radial saws.
296-806-45536	Operate mechanical power presses safely.	296-806-48034	Provide kickback protection for radial saws used for ripping wood products.
296-806-45538	Provide tools and other means to protect press operators.	296-806-48036	Guard revolving double arbor saws.
296-806-45540	Inspect and maintain presses.	296-806-48038	Guard swing saws.
296-806-45542	Make sure presses and operating practices used in the PSDI (presence sensing device initiation) mode of operation meet these requirements.	296-806-48040	Limit the travel of swing saws.
	MILLS		Requirements for Band Saws and Drag Saws
296-806-460	Summary.	296-806-48042	Make sure band saws meet these requirements.
296-806-46002	Meet height requirements for mill rolls.	296-806-48044	Protect employees from drag saw hazards.
296-806-46004	Provide mill safety controls.		CUTTING HEADS
296-806-46006	Follow these stopping limit requirements for mills.		General Requirements for All Cutting Heads
	PRESS BRAKES	296-806-48046	Maintain and balance knives and cutting heads.
296-806-465	Summary.		BORING AND MORTISING MACHINES
	GENERAL REQUIREMENTS FOR PRESS BRAKES	296-806-48048	Make sure boring and mortising machines meet these requirements.
296-806-46502	Provide auxiliary safety aids on press brakes.		CHIPPER AND HOG MILLS
296-806-46504	Safeguard the point of operation on press brakes.	296-806-48050	Follow these requirements for chipper mills.
	SAFE DISTANCE SAFEGUARDING	296-806-48052	Follow these requirements for hog mills.
296-806-46506	Follow this requirement when using safe distance safeguarding.	296-806-48054	Protect employees from falling into chipper and hog mills.
296-806-46508	Develop a safe distance safeguarding program for press brakes.		JOINTERS
296-806-46510	Follow these requirements for safe distance training for press brakes.	296-806-48056	Make sure jointers with horizontal cutting heads meet these requirements.
296-806-46512	Require safe distance retraining for press brake operations.	296-806-48058	Guard horizontal cutting heads on hand-fed jointers.
296-806-46514	Conduct periodic safe distance inspections on press brakes.	296-806-48060	Guard vertical cutting heads on jointers.
296-806-46516	Supervise the safe distance program for press brakes.		MOLDING, STICKING AND MATCHING MACHINES
	ROLL-FORMING AND BENDING MACHINES	296-806-48062	Make sure molding, sticking and matching machines meet these requirements.
296-806-470	Summary.		PANEL RAISERS AND OTHER SIMILAR MACHINES
296-806-47002	Follow these requirements for machine initiation.	296-806-48064	Guard hand-fed panel raisers and other similar machines.
296-806-47004	Safeguard nip points of roll-forming and bending machines.		PLANERS
	SANDING MACHINES	296-806-48066	Make sure planers with a horizontal cutting head meet these requirements.
296-806-475	Summary.	296-806-48068	Guard planers.
296-806-47502	Guard drum sanders.	296-806-48070	Guard planer feed rolls.
296-806-47504	Guard disk sanders.	296-806-48072	Provide kickback protection on planers running stock of varied thicknesses.
296-806-47506	Guard belt sanders.		SHAPERS
296-806-47508	Follow these requirements for feed roll guarding.	296-806-48074	Make sure shapers meet these requirements.
	SAWS AND CUTTING HEADS		TENONING MACHINES
296-806-480	Summary.	296-806-48076	Guard tenoning machine feed chains and sprockets.
	GENERAL REQUIREMENTS FOR ALL SAWS AND CUTTING HEADS	296-806-48078	Guard tenoning machines.
296-806-48002	Protect employees using saws and cutting heads.		VENEER MACHINES
296-806-48004	Make sure saws and cutting heads are sharpened and tensioned by qualified people.	296-806-48080	Guard veneer cutters and wringer knives.
	SAWS	296-806-48082	Guard veneer clippers.
	General Requirements for All Saws	296-806-48084	Follow these requirements for guarding guillotine cutters.
296-806-48006	Make sure saws are safe to use.	296-806-48086	Provide mechanisms to stop power-driven guillotine cutters.
	Requirements for All Circular Saws	296-806-48088	Prohibit riders on veneer slicer carriages.
296-806-48008	Make sure all circular saws meet these requirements.		SEWING MACHINES
296-806-48010	Make sure circular saw gages meet these requirements.	296-806-485	Summary.
296-806-48012	Safeguard hand-fed circular table saws.	296-806-48502	Guard sewing machine needles.
296-806-48014	Provide kickback protection for employees using hand-fed circular table rip-saws when ripping wood products.	296-806-500	Definitions.

**WAC 296-806-100 Scope.** Machines and their moving parts create the potential for workplace injuries. Installed and used properly safeguards can protect workers by helping to reduce or control machine hazards.

This chapter applies if you have machines or machine operations in your workplace. For requirements on hand-held tools go to Portable power tools, chapter 296-807 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-100, filed 6/29/04, effective 1/1/05.]

### REQUIREMENTS FOR ALL MACHINES

**WAC 296-806-200 Summary.** This section applies to all machines in your workplace. It is organized into the following four categories:

- General requirements.
- Safeguarding requirements.
- Safeguarding methods.
- Requirements for specific machine hazards.

**Reference:**

- In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to determine if additional requirements are listed for machines or operations in your workplace:
  - Additional requirements for some machines and machine operations, WAC 296-806-400.
  - For requirements that apply to hand-held tools, see Portable power tools, chapter 296-807 WAC.

#### Your responsibility:

To protect employees from machine hazards in your workplace.

#### You must:

##### GENERAL REQUIREMENTS

##### WORKPLACE

Secure machines designed to stay in one place  
WAC 296-806-20002.

Protect employees from slipping hazards around machinery

WAC 296-806-20004.

Arrange work areas to avoid creating hazards

WAC 296-806-20006.

##### MACHINE CONTROLS AND OPERATION

Make sure operating controls meet these requirements

WAC 296-806-20008.

Protect employees from unintentional machine operation

WAC 296-806-20010.

Make sure emergency stop controls meet these requirements

WAC 296-806-20012.

Control machine vibration

WAC 296-806-20014.

Prevent overspeed conditions

WAC 296-806-20016.

Make sure hand feeding and retrieval tools meet these requirements

WAC 296-806-20018.

Protect employees who are adjusting or repairing machinery

WAC 296-806-20020.

##### POWER TRANSMISSION PARTS

Keep power transmission parts in good working condition

WAC 296-806-20022.

Inspect power transmission parts

WAC 296-806-20024.

Protect employees lubricating moving machinery

WAC 296-806-20026.

##### SAFEGUARDING REQUIREMENTS

##### SAFEGUARD MACHINERY

Safeguard employees from the point of operation

WAC 296-806-20028.

Safeguard employees from nip or shear point hazards

WAC 296-806-20030.

Safeguard employees from rotating or revolving parts

WAC 296-806-20032.

Safeguard employees from reciprocating or other moving parts

WAC 296-806-20034.

Safeguard employees from flying objects

WAC 296-806-20036.

Safeguard employees from falling objects

WAC 296-806-20038.

Safeguard employees from hazards created by moving surfaces with hazards such as sharp edges, burrs, and protruding nails and bolts

WAC 296-806-20040.

##### SAFEGUARDING METHODS

##### Guards

Make sure guards meet these requirements

WAC 296-806-20042.

##### Devices

Make sure devices meet these requirements

WAC 296-806-20044.

Make sure light curtains meet these requirements

WAC 296-806-20046.

Make sure pressure-sensitive mats meet these requirements

WAC 296-806-20048.

Make sure restraint or pullback devices meet these requirements

WAC 296-806-20050.

Make sure two-hand devices meet these requirements

WAC 296-806-20052.

Make sure devices used with barrier guards meet these requirements

WAC 296-806-20054.

##### Distance

Make sure safeguarding by distance meets these requirements

WAC 296-806-20056.

Make sure guardrails used for safeguarding meet these requirements

WAC 296-806-20058.

##### REQUIREMENTS FOR SPECIFIC MACHINE HAZARDS

Fit arbors and mandrels to the machine

WAC 296-806-30002.

Safeguard belt and rope drives

WAC 296-806-30004.

Make sure belt or rope drives meet these requirements

WAC 296-806-30006.

Protect employees while shifting belts on belt and pulley drives

WAC 296-806-30008.

Make sure belt tighteners meet these requirements

WAC 296-806-30010.

Safeguard cams, connecting rods, tail rods, and extension piston rods

WAC 296-806-30012.

Safeguard chain and sprocket drives

WAC 296-806-30014.

Safeguard fan blades

WAC 296-806-30016.

Safeguard flywheels

WAC 296-806-30018.

Safeguard gears

WAC 296-806-30020.

Safeguard projections on moving parts

WAC 296-806-30022.

Safeguard pulleys

WAC 296-806-30024.

Make sure pulleys meet these requirements

WAC 296-806-30026.

Safeguard revolving drums, barrels, and containers

WAC 296-806-30028.

Safeguard shafting

WAC 296-806-30030.

Make sure shafting meets these requirements

WAC 296-806-30032.

Safeguard unused keyways

WAC 296-806-30034.

Make sure revolving collars meet these requirements

WAC 296-806-30036.

Safeguard counterweights

WAC 296-806-30038.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-200, filed 6/29/04, effective 1/1/05.]

## WORKPLACE

**WAC 296-806-20002 Secure machines designed to stay in one place.**

**You must:**

• Make sure machines designed to stay in one place are secured so they will not move or change position during use.

**Exemption:** Machines that have either rubber feet or foot pads made of nonskid (high coefficient of friction) or similar vibration dampening materials do not have to be secured as long as the machine will not tip, fall over, or walk (move).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20002, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20004 Protect employees from slipping hazards around machinery.**

**You must:**

• Make sure employees working around dangerous machines are protected from slipping on smooth, oily, or otherwise slippery floors by providing one of the following types of floor covering:

- Nonslip matting.
- Grating.
- Nonslip composition flooring.
- Some other effective floor treatment.

**Reference:** For additional requirements about housekeeping, personal protective equipment (PPE), and work practices, see the Safety and health core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20004, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20006 Arrange work areas to avoid creating hazards.**

**You must:**

- Make sure work areas around machinery are designed with enough space so each operator:
  - Can clean and handle material without interference from other workers or machines.
  - Does **not** have to stand in the way of passing traffic.
- Provide enough space so employees can bring in and remove materials safely.

**Reference:** For requirements that apply to Aisles and passageways, see WAC 296-24-73505.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20006, filed 6/29/04, effective 1/1/05.]

## MACHINE CONTROLS AND OPERATIONS

**WAC 296-806-20008 Make sure operating controls meet these requirements.**

**Exemption:** This rule does not apply to constant pressure controls used only for setup.

**You must:**

(1) Make sure each machine has a control that both:

- Stops the machine;

**AND**

• Can be reached by the operator without leaving the operator's position.

(2) Make sure the operator can easily reach all machine controls without reaching into a hazard area of the machine.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20008, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20010 Protect employees from unintentional machine operation.**

**You must:**

(1) Make sure foot-operated controls are located or guarded so that unintentional movement to the "ON" position is unlikely.

(2) Make sure machines will **not** automatically restart when power is restored after a power failure, if restarting would create a hazard for employees.

**Note:** Operating controls can be protected from unintentional movement by methods such as covers on foot treadles and collars around machinery start buttons.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20010, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20012 Make sure emergency stop controls meet these requirements.**

**You must:**

• Make sure emergency stop controls, if required, meet **all** the following:

- Are red in color.
- Are easily reached from the operator's normal work position.
- Are kept in a good working condition.
- Have to be manually reset before a machine can be restarted.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20012, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-20014 Control machine vibration.**

##### **You must:**

- Prevent excessive machine vibration that could create a hazard to employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20014, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-20016 Prevent overspeed conditions.**

##### **You must:**

- Operate tools and equipment within their rated speed.

**Note:** Actions that could cause an overspeed condition include:

- Installing a more powerful motor.
- Changing or increasing the power source.
- Changing attachment size or type, such as a blade or wheel.
- The attachment speed (rpm) and motor speed (rpm) should match.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20016, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-20018 Make sure hand feeding and retrieval tools meet these requirements.**

##### **You must:**

- Make sure hand feeding and retrieval tools:
  - Are suitable for the work to be done.
  - Do not create a hazard when used.
  - Are of a size and shape that will keep the operator's hands outside the hazardous area.
  - Are constructed so they will not shatter if they come in contact with the machine tool or tooling.

**Note:** Hand feeding and retrieval tools, such as push sticks or push blocks, can **not** be used instead of required safeguarding, unless a specific machine requirement allows it.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20018, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-20020 Protect employees who are adjusting or repairing machinery.**

**Exemption:** This rule does not apply if the machine has to be in motion to properly adjust it.

##### **You must:**

- Make sure power-driven machinery is completely stopped before **either**:
  - Making adjustments or repairs;
- OR**
- Removing material or refuse from the machine.

**Reference:** For requirements about maintaining and servicing machinery where the unexpected start-up, energization, or release of stored energy could injure an employee are in Lockout/tagout (control of hazardous energy), chapter 296-803 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20020, filed 6/29/04, effective 1/1/05.]

### **POWER TRANSMISSION PARTS**

#### **WAC 296-806-20022 Keep power transmission equipment in good working condition.**

##### **Definition:**

(2007 Ed.)

A power transmission part is a mechanical component of a system that provides motion to a part of a machine or piece of equipment.

##### **You must:**

- Make sure power transmission parts are kept in good working condition at **all** times.
- Keep bearings free from lost motion and well lubricated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20022, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-20024 Inspect power transmission parts.**

##### **You must:**

- Inspect power transmission parts **at least** once every sixty days to make sure that all:
  - Safeguarding meets the requirements of this chapter.
  - Parts are in proper alignment.
  - Bolts and screws that hold power transmission parts together or support the system are tight.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20024, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-20026 Protect employees lubricating moving machinery.**

##### **You must:**

- (1) Protect employees who lubricate moving machinery by:
  - Providing tools, such as oil cans or grease guns, that have spouts or necks that are long enough to keep the employees' hands out of hazardous areas.
  - Requiring employees to wear closely fitted clothing.

**Note:** Things such as clothing, hair, and jewelry can get caught in machinery and be a hazard on the job.

##### **You must:**

- (2) Make sure drip cups and pans are securely fastened to the machinery.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20026, filed 6/29/04, effective 1/1/05.]

### **SAFEGUARDING REQUIREMENTS**

#### **WAC 296-806-20028 Safeguard employees from the point of operation.**

##### **IMPORTANT:**

If a specific safeguarding method in this chapter is required for machinery or machine parts found in your workplace, follow the specific requirement.

In the absence of a specific safeguarding method required by this or some other chapter, you need to choose a method or combination of methods from the safeguarding requirements found in Safeguarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

##### **You must:**

- Protect employees from hazards created by the point of operation by using one or more safeguarding methods.

[Title 296 WAC—p. 2757]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20028, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20030 Safeguard employees from nip or shear point hazards.**

**You must:**

- Protect employees from hazards created by nip or shear points by using one or more safeguarding methods.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20030, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20032 Safeguard employees from rotating or revolving parts.**

**You must:**

- Protect employees from hazards created by rotating or revolving parts by using one or more safeguarding methods.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20032, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20034 Safeguard employees from reciprocating or other moving parts.**

**You must:**

- Protect employees from hazards created by reciprocating or other moving parts by using one or more safeguarding methods.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20034, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20036 Safeguard employees from flying objects.**

**You must:**

- Protect employees from hazards created by flying objects, including chips, sparks, and fluids by using one or more safeguarding methods.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20036, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20038 Safeguard employees from falling objects.**

**You must:**

- Protect employees from hazards created by falling objects by using one or more safeguarding methods.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20038, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20040 Safeguard employees from moving surfaces with hazards.**

**You must:**

- Safeguard employees from hazards created by moving surfaces with hazards such as sharp edges, burrs, and protruding nails and bolts.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20040, filed 6/29/04, effective 1/1/05.]

**SAFEGUARDING METHODS**  
**Guards**

**WAC 296-806-20042 Make sure guards meet these requirements.**

**You must:**

[Title 296 WAC—p. 2758]

- Make sure guards do **not** create additional hazards such as sharp edges or pinch points between the guard and moving machine parts.

- Make sure guards are:

- Made of durable materials.

- Strong enough to withstand the forces to which they are exposed.

- Securely fastened to the machine, if possible, or to the building structure if they cannot be attached to the machine.

- Make sure guards protect employees by doing **both** of the following:

- Preventing hands or other body parts from reaching through, over, under, or around the guard into the hazard area;

**AND**

- Preventing objects or debris from falling onto or being thrown towards an employee.

- Make sure barrier guards:

- Are properly installed, adjusted, and maintained.

- Have no opening at any point larger than shown in Table 200-1, Largest Allowable Guard Opening.

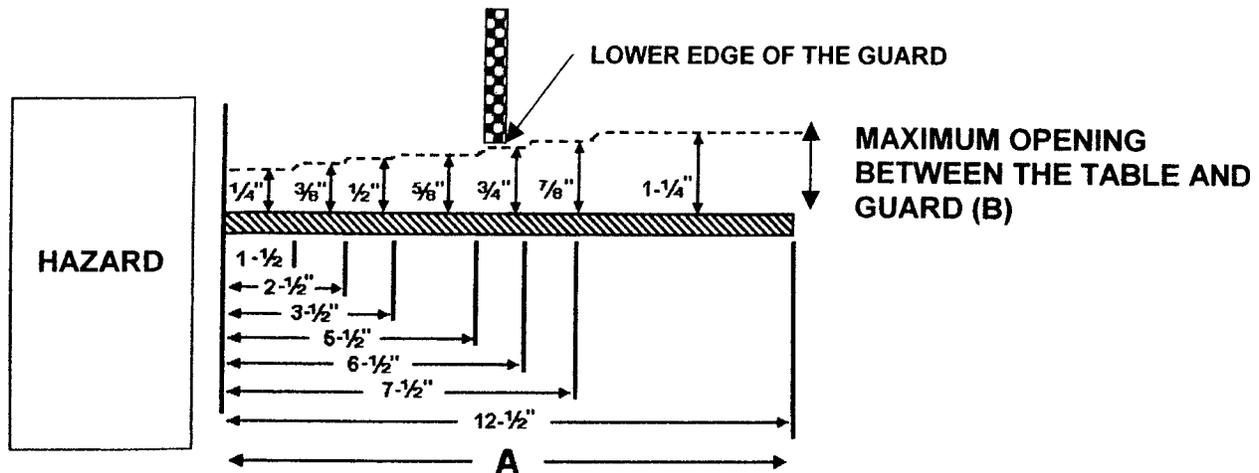
**Reference:** Metal cutting shears are allowed to be guarded with properly applied awareness barrier safeguarding as described in ANSI B11.4-1993, Sections 6.3.3.

**Table 200-1**

<b>Largest Allowable Guard Opening (inches)</b>	
<b>If the distance (A) from hazard to the guard is:</b>	<b>Then the opening (B) in the guard or between the table and the guard can NOT be greater than:</b>
1/2 to 1 1/2	1/4
1 1/2 to 2 1/2	3/8
2 1/2 to 3 1/2	1/2
3 1/2 to 5 1/2	5/8
5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 12 1/2	1 1/4
12 1/2 to 15 1/2	1 1/2
15 1/2 to 17 1/2	1 7/8
17 1/2 to 31 1/2	2 1/8
Over 31 1/2	6

This diagram illustrates the information found in Table 200-1. The size of the opening in the guard, or between the bottom edge of the guard and the feed table is small enough to prevent any part of the operator's body from reaching the hazardous area.

Illustration #1 - Distance from hazard to Guard (A)



[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20042, filed 6/29/04, effective 1/1/05.]

### DEVICES

#### WAC 296-806-20044 Make sure devices meet these requirements.

##### You must:

• Make sure devices used to safeguard employees do either of the following:

– Stop the motion of a moving part before an employee comes in contact with it and has to be manually reset before machines can be restarted;

##### OR

– Be designed and constructed to prevent the operator from having any part of their body in the danger zone during the hazardous part of the operating cycle.

**Reference:** For more information on installation of safety devices, see Performance criteria for safeguarding, ANSI B11.19-2003.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20044, filed 6/29/04, effective 1/1/05.]

#### WAC 296-806-20046 Make sure light curtains meet these requirements.

##### IMPORTANT:

All devices must meet the general requirements for devices found in, Make sure devices meet these requirements, WAC 296-806-20044.

##### You must:

• Make sure light curtains, when used:

– Respond to the presence of an operator's hand, other body part, or a work piece.

– Have indicators that are easily seen by the operator showing when the device is functioning or has been bypassed.

**Note:** Even if a shiny reflective object or work piece is used with a light curtain or other electro-optical device, it should still respond to the operator's hand or other body part.

##### You must:

• Make sure only authorized persons can make the following adjustments to light curtains:

– Variations in operating conditions.

– Fixed or channel blanking.

– Floating blanking (sometimes referred to as floating channel or floating window features).

• Safeguard access to the point of operation that is **not** protected by light curtains.

**Reference:** For more information on light curtains and their requirements, see Performance criteria for safeguarding, ANSI B11.19-2003

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20046, filed 6/29/04, effective 1/1/05.]

#### WAC 296-806-20048 Make sure pressure-sensitive mats meet these requirements.

##### IMPORTANT:

All devices must meet the general requirements for devices found in, Make sure devices meet these requirements, WAC 296-806-2004.

##### You must:

• Make sure pressure-sensitive mats:

– Detect the presence or absence of the operator or others.

– Send the stop command and prevent successive machine cycles if any single component fails.

– Are connected with the machine control system so the device's stop signal immediately stops action of the machine tool and requires use of the start control before the machine can begin another cycle.

– Are located so that the operator can **not** reach the recognized hazard before hazardous motion has stopped.

– Have an indicator easily seen by the operator that shows the mat is operating.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20048, filed 6/29/04, effective 1/1/05.]

#### WAC 296-806-20050 Make sure restraint or pullback devices meet these requirements.

##### IMPORTANT:

All devices must meet the general requirements for devices found in, Make sure devices meet these requirements, WAC 296-806-20044.

##### You must:

• Make sure restraint or pullback devices:

- Prevent the operator from reaching into the point of operation or withdraw the operator's hands from the point of operation before motion of the machine creates a hazard.

- Have fasteners, pins, and other items used to secure and maintain the setting of the device applied in a way that minimizes loosening, slipping, or failure during use.

- Are worn inside gloves, if used, so if a glove becomes trapped inside a machine or tool, the device can still remove the operator's hand from the hazard area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20050, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20052 Make sure two-hand devices meet these requirements.**

**IMPORTANT:**

All devices must meet the general requirements for devices found in, Make sure devices meet these requirements, WAC 296-806-20044.

**You must:**

- Make sure two-hand devices:
  - Protect each hand device against accidental operation.
  - Require simultaneous operation of both hand devices to begin the cycle, including the first cycle (automatic mode).
  - Are provided with an antirepeat feature when used in single cycle mode.
  - Have a set of devices for each operator if more than one needs to be safeguarded.
  - Are located far enough from the nearest hazard so the operator can **not** reach the hazard before hazardous motion stops.

**Reference:** For more information on proper installation of safety devices, see Performance criteria for safeguarding, ANSI B11.19-2003.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20052, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-20054 Make sure devices used with barrier guards meet these requirements.**

**IMPORTANT:**

All devices must meet the general requirements for devices found in, Make sure devices meet these requirements, WAC 296-806-20044.

**You must:**

- Make sure movable barrier devices:
  - Return to the open position if they encounter an obstruction while enclosing the hazardous area.
  - Are designed so the operator or others cannot reach the hazard by reaching over, under, around or through the device when it is in the closed position.
- Make sure interlocks used with barrier guards do **all** of the following:
  - Stop hazardous motion of machines when interlocks are open.
  - Are **not** easily bypassed.
  - Are designed and installed so that closing the interlocks will not cause a hazard to employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-20054, filed 6/29/04, effective 1/1/05.]

**DISTANCE**

**WAC 296-806-20056 Make sure safeguarding by distance meets these requirements.**

**You must:**

- Make sure means used to safeguard by distance do both of the following:
  - Prevent parts or material from falling on employees below;
- AND**
  - Separate employees on fixed ladders, stairs, floors, or other walking or working surfaces from the hazard by:
    - More than seven feet vertically;
- OR**
  - A horizontal distance that prevents employees from contacting or being injured by the hazard according to the distances in Table 200-2.

**TABLE 200-2**

**SAFE DISTANCES FROM FIXED BARRIERS TO HAZARDS**

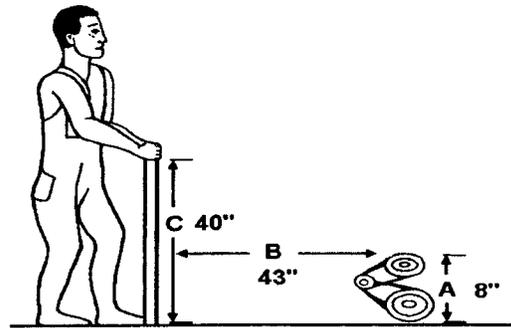
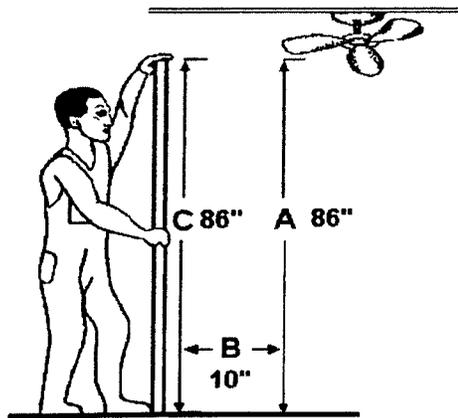
Table 200-2 helps you identify either the required horizontal distance from the hazard to the barricade (B), or the required height of the barricade (C), as long as you know A and either variable, B or C.

**Table 200-2  
Safe Distances for Fixed Barricades (B)**

Height of the Hazard (A)	Height of the Barricade (C)							
	96	86	78	71	63	55	48	40
96	0	4	4	4	4	4	4	4
86	....	10	14	16	20	20	24	24
78	....	....	14	20	24	28	36	43
71	....	....	....	24	36	36	40	43
63	....	....	....	20	36	36	40	51
55	....	....	....	4	32	36	40	51
48	....	....	....	....	20	36	40	55
40	....	....	....	....	12	36	40	55
32	....	....	....	....	....	24	36	51
24	....	....	....	....	....	....	20	48
16	....	....	....	....	....	....	12	48
8	....	....	....	....	....	....	8	43

**Note:** The height and distance requirements of Table 200-2 are designed to safeguard workers from a fixed hazard. If a hazard involves flying chips, fluids, parts or materials, the barrier height, distance, and construction may need to be adjusted to provide adequate protection.

Illustration 2 - How to measure variables for Table 2



## Examples:

- If the height of the hazard (A) is seventy-eight inches, and the horizontal distance from the hazard to the barricade (B) is fourteen inches, the required height of the barricade (C) is seventy-eight inches.
- If the height of the hazard (A) is eighty-six inches, and the height of the barricade (C) is fifty-five inches, then the required horizontal distance from the hazard to the barricade (B) is twenty inches.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20056, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-20058 Make sure guardrails used for safeguarding meet these requirements.

- Note:** Guardrails may be used to safeguard:
- Flywheels.
  - Cranks and connecting rods.
  - Tail rods and extension piston rods.
  - Horizontal belts in a power generating room.
  - Clutches, cutoff couplings, or clutch pulleys in an engine room occupied only by an attendant.
  - Power transmission parts on a runway used only for oiling, maintenance, running adjustment, or repair work.

**You must:**

- Make sure top rails are:
  - Smooth-surfaced.
  - Strong enough to withstand a force of at least two hundred pounds.
  - Between thirty-nine and forty-five inches above the floor, platform, runway, or ramp.
- Make sure guardrails have an intermediate rail (mid-rail) installed approximately halfway between the top rail and the floor, platform, runway, or ramp.
- Make sure rails do not extend beyond the end posts of the guardrail and create a projection hazard.
- Make sure toe boards, if required by this chapter to safeguard a machinery hazard, are:
  - At least four inches high.
  - Securely fastened in place with no more than one-fourth inch between the bottom of the toe board and the floor, platform, runway, or ramp.
  - Made of substantial material that is either solid or that has openings in the material no larger than one inch.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-20058, filed 6/29/04, effective 1/1/05.]

### REQUIREMENTS FOR SPECIFIC MACHINE HAZARDS

#### WAC 296-806-30002 Fit arbors and mandrels to the machine.

**You must:**

- Make sure that arbors and mandrels:
  - Have firm and secure bearing.
  - Are free from play.
- Only place or mount attachments on a machine arbor that have been accurately machined to the correct size and shape.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-30002, filed 6/29/04, effective 1/1/05.]

#### WAC 296-806-30004 Safeguard belt and rope drives.

- Exemption:**
- You do not need to safeguard the following types of belts when they are operating at two hundred and fifty linear feet per minute or less:
    - Flat belts that are:
      - One inch wide or less.
      - Two inches wide or less and have no metal lacings or fasteners.
    - Round belts one-half inch or less in diameter.
    - Single-strand v-belts 13/32 inch wide or less.
  - You do not need to safeguard belts that are in a room, vault, or similar space that contains only power transmission parts or equipment if the space:
    - Is controlled by lock and key or has similarly restricted access that allows only authorized persons to enter.
    - Is well lit.
    - Has a dry, level, and firm floor.
    - Has a well-marked route with a vertical clearance of at least five feet six inches for authorized employees to follow to perform their duties.
  - You do not need to safeguard belt drives of light or medium duty sewing machines if **all** of the following apply:
    - It uses either a flat or a round belt without metal lacings and fasteners.
    - The belt is located above the table top.
    - The table top is designed so that employees near the machine are not exposed to motion hazards while they work or as they pass by.
    - The machine is not used to sew heavy materials such as leather, canvas, denim, or vinyl.

[Title 296 WAC—p. 2761]

– The operators' hands are not in, near, or on the wheel, nip point, belt area, or other motion hazard when the machine is operating.

**Reference:** You may need to follow additional requirements for sewing machines. See, Sewing machines, WAC 296-806-485, later in this chapter for more information.

**You must:**

• Safeguard belt or rope drives that are seven feet or less above the floor or working surface.

**Reference:** In the absence of a specific safeguarding method, follow the safeguarding requirements found in safeguarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

**Note:** You may use a nip point and pulley guard on a vertical or inclined belt if it meets **all** of the following requirements:

- Two and one-half inches wide or less.
- Running at a speed of less than one thousand feet per minute.
- Free from metal lacings or fastenings.

**You must:**

• Safeguard overhead belts located more than seven feet above the floor or working surface if **any of the following** apply:

– The belt is located over a passageway or work space and travels at a speed of eighteen hundred feet per minute or more.

– The distance between the centers of its pulleys is ten feet or more.

– The belt is wider than eight inches.

• Safeguard the space between the upper and lower runs of a horizontal belt if there is enough room for an employee to pass between them by providing both:

– A guard along the upper run to keep the belt from contacting the worker or anything they may be carrying;

**AND**

– A platform over the lower run that has a railing that is completely filled in with wire mesh or other filler or by a solid barrier.

**Note:** The passage between the two belts is considered safeguarded if you completely block it with a guardrail or other barrier.

**Exemption:** In a power generating room, only the lower run of a horizontal belt has to be safeguarded.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-30004, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-30006 Make sure belt or rope drives meet these requirements.**

**You must:**

(1) Use an idler when your machine uses a quarter-twist belt that can run in either direction.

(2) Make sure, when it is necessary to apply dressing to moving belts or ropes, that you apply the dressing at a point where the belts or ropes leave the pulley.

(3) Make sure that a belt shifted by hand is **not** fastened with metal or other material that creates a hazard.

(4) Make sure a bearing support that is next to a friction clutch or cutoff coupling has self-lubricating bearings that do not need frequent attention.

(5) Use a substantial belt perch, such as a bracket or roller, when it is not practical to use a loose pulley or idler to keep idle belts away from shafts.

[Title 296 WAC—p. 2762]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-30006, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-30008 Protect employees while shifting belts on belt and pulley drives.**

**Exemption:** A belt shifter is not required on a belt and pulley system if:

- It was installed on or before August 17, 1971;

**OR**

- The belt and pulley drive meets **all** of these requirements:

– The belt is endless or laced with rawhide.

– A nip point guard in front of the cone safeguards the nip point of the belt and pulley.

– The nip point guard extends at least to the top of the largest step of the cone and is formed to show the contour of the cone.

**Definition:** A nip point belt and pulley guard is a guard that encloses the pulley and has rounded or rolled edge slots for the belt to pass through.

**You must:**

(1) Provide a permanent mechanical belt shifter on belt drives that use either:

- Tight and loose (drive and idler) pulleys;

**OR**

- A cone pulley.

(2) Protect employees from the nip point of the belt and pulley by either:

- The belt shifter or clutch handle;

**OR**

• A vertical guard in front of the pulley that extends at least to the top of the largest step of the cone.

(3) Make sure a belt shifter or clutch handle is:

- Rounded to keep the operator from being injured.
- Easy to reach.

• Positioned to reduce the chance of being accidentally moved.

- Located either:

– Over the machine;

**OR**

– Not higher than six feet six inches above the floor.

(4) Make sure each belt shifter or clutch handle of the same type in your workplace moves in the same direction to stop a machine, that is, either all right or all left.

**Exemption:** A friction clutch handle on a countershaft carrying two clutch pulleys with open and crossed belts is not required to move in the same direction as all other clutch handles or belt shifters if:

- The clutch handle has three positions;

**AND**

- The machine is at rest when the clutch handle is in the center position.

**You must:**

(5) Use a belt shifter to shift a belt on and off a fixed pulley.

• When a belt shifter cannot be used, you may use a belt pole if it is both:

– Smooth;

**AND**

– Large enough to grasp securely.

**Note:** A belt pole is also known as a "belt shipper" or "shipper pole."

**You must:**

(6) Provide a locking-type belt shifter or other positive securing device on woodworking machines driven by belts and shafting.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30008, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30010 Make sure belt tighteners meet these requirements.**

**You must:**

- Make sure belt tighteners:
  - Are substantially constructed and securely fastened.
  - Have bearings that are securely capped.
  - Have a mechanism to prevent them from falling.
- Make sure belt tighteners used to activate machinery are securely held in the "OFF" position by either:

– Gravity;

**OR**

- An automatic mechanism that must be released by hand.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30010, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30012 Safeguard cams, connecting rods, tail rods, and extension piston rods.**

**You must:**

- Safeguard cams, connecting rods, tail rods, or extension piston rods that could be contacted by employees.

**Reference:** In the absence of a specific safeguarding method, follow the safeguarding requirements found in safeguarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

**You must:**

- Make sure guardrails used to safeguard the side or ends of rods are at least fifteen inches away from the rod when it is fully extended.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30012, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30014 Safeguard chain and sprocket drives.**

**Exemption:** This section does not apply to hand-operated sprockets.

**You must:**

- Enclose chains and sprocket wheels that are seven feet or less above the floor or working surface.
- Make sure chain and sprocket drive enclosures that extend over machine or other working areas protect workers from falling drive parts.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30014, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30016 Safeguard fan blades.**

**Reference:** In the absence of a specific safeguarding method, follow the safeguarding requirements found in safeguarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

**Exemption:** A fan is considered guarded if it meets all of the following requirements:

- It is in a basement, tower, or room locked against unauthorized entrance.
- The vertical clearance in passageways between the floor and power transmission beams, ceiling, or any other objects, is not less than five feet six inches.
- The intensity of illumination must be a minimum of ten foot candles when the area is occupied.
- The footing is dry, firm, and level.
- The route followed by the oiler or authorized personnel is protected in such a manner as to prevent accident.
- The periphery of the fan blade is covered by a shroud.

**You must:**

- Protect employees from exposure to the blades of any fan less than seven feet above the floor or working surface.
- Prevent rods, pipes, or other material being handled by workers, from contacting moving fan blades.

**Reference:** For guard opening requirements, see Table 200-1, Largest Allowable Guard Opening in, Make sure guards meet these requirements, WAC 296-806-20042.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30016, filed 6/29/04, effective 1/1/05.]

## **FLYWHEELS**

### **WAC 296-806-30018 Safeguard flywheels.**

**You must:**

- Safeguard flywheels that have any part of the wheel seven feet or less above the floor or working surface with either:

– An enclosure;

**OR**

– A guardrail, at least fifteen inches but no more than twenty inches from the rim.

- Make sure enclosures that safeguard flywheels located above a working area are strong enough to hold the weight of the wheel, if a shaft or wheel mounting fails.

• Provide a toeboard on guardrails used to safeguard flywheels that have any part of the wheel within twelve inches of the floor or working surface.

• Do both of the following to safeguard spoked flywheels that are five feet or less in diameter with smooth rims, when enclosures or guardrails cannot be used:

– Cover the spokes on the exposed side of the wheel with a disk guard that creates a smooth surface and edge;

**AND**

– Remove or cover keys or other dangerous projections on the wheel that are not covered by the disk guard.

**Exemption:**

- You may leave an open space of four inches or less between the outside edge of the disk guard and the rim of the spoked flywheel to make it easier to turn the wheel over.
- You may use an adjustable guard for the flywheel of a gasoline or diesel engine for starting the engine or for making running adjustments. A slot opening for a jack bar is permitted.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30018, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30020 Safeguard gears.**

**You must:**

- Safeguard gears that are seven feet or less above the floor or working surface.

**Reference:** In the absence of a specific safeguarding method, follow the safeguarding requirements found in safe-

guarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

**Exemption:** You do not need to guard hand-operated gears that are used only to adjust machine parts that stop when the gears are not being turned by hand.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30020, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30022 Safeguard projections on moving parts.**

**You must:**

• Safeguard projections on moving parts such as keys, setscrews, bolts, and nuts, by:

- Removing them.
- Making them flush.
- Guarding with metal covers.

**Exemption:** This requirement does not apply to keys or setscrews that are:

- Within an enclosure.
- Below the plane of the rim of a pulley that is less than twenty inches in diameter.
- Located where employee contact is not possible.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30022, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30024 Safeguard pulleys.**

**You must:**

• Safeguard pulleys that have any part of the pulley seven feet or less above the floor or working surface.

**Reference:** In the absence of a specific safeguarding method, follow the safeguarding requirements found in safeguarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

**Exemption:** You do not need to safeguard pulleys that are in a room, vault, or similar space that contain only power transmission parts or equipment if the space:

- Is controlled by lock and key or has similarly restricted access that allows only authorized persons to enter.
- Is well lit.
- Has a dry, level, and firm floor.
- Has a well-marked route with a vertical clearance of at least five feet six inches for authorized employees to follow to perform their duties.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30024, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30026 Make sure pulleys meet these requirements.**

**You must:**

(1) Make sure pulleys are designed and balanced for the speed at which they operate.

(2) Make sure **not** to use pulleys that are cracked or have a piece broken out of the rim.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30026, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30028 Safeguard revolving drums, barrels, and containers.**

**You must:**

• Safeguard revolving drums, barrels, or containers by an enclosure that is interlocked with the drive mechanism so that they cannot revolve unless the enclosure is in place.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30028, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30030 Safeguard shafting.**

**Exemption:** You do not need to safeguard shafting that is in a room, vault, or similar space that contains only power transmission parts or equipment if the space:

- Is controlled by lock and key or has similarly restricted access that allows only authorized persons to enter.
- Is well lit.
- Has a dry, level, and firm floor.
- Has a well-marked route with a vertical clearance of at least five feet six inches for authorized employees to follow to perform their duties.

**You must:**

• Enclose shafting that is seven feet or less above the floor or working surface.

• Make sure projecting shaft ends either:

– Have a smooth edge, smooth end, and project no more than one-half the diameter of the shaft;

**OR**

– Are guarded by a nonrotating cap or safety sleeve.

• Safeguard shafting under a bench or table by enclosing it in a stationary casing or by using a trough with sides that both:

– Cover the shafting to within six inches of the bottom of the table or to within six inches of the floor or working surface, whichever is appropriate;

**AND**

– Extend two inches beyond the end of the shafting.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30030, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30032 Make sure shafting meets these requirements.**

**You must:**

(1) Keep shafting free of:

- Excessive oil or grease.
- Rust or pitting from corrosion.

(2) Secure shafting against excessive endwise movement.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30032, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-30034 Safeguard unused keyways.**

**You must:**

• Fill, cover, or otherwise safeguard all unused keyways.

**Reference:** In the absence of a specific safeguarding method, follow the safeguarding requirements found in safeguarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30034, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-30036 Make sure revolving collars meet these requirements.****You must:**

- Make sure revolving collars are cylindrical.
- Make sure screws or bolts used in the collar do **not** project beyond the outside of the collar.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30036, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-30038 Safeguard counterweights.****You must:**

- Provide safeguarding for all counterweights where employees are exposed to contact.

**Reference:** In the absence of a specific safeguarding method, follow the safeguarding requirements found in safeguarding methods, WAC 296-806-20042 through 296-806-20058. Examples of safeguarding methods include:

- Guards.
- Devices.
- Safeguarding by distance.
- Safeguarding by location.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-30038, filed 6/29/04, effective 1/1/05.]

**ADDITIONAL REQUIREMENTS FOR SOME MACHINES AND MACHINE OPERATIONS**

**WAC 296-806-400 Summary.** If your specific machine or operation is not listed here, then follow the "Requirements for all machines" found in this chapter, WAC 296-806-200 and 296-806-300.

**Your responsibility:**

To protect employees from hazards associated with specific machines and their operations in your workplace.

**You must:**

Abrasive wheels and machines  
WAC 296-806-405.  
Calenders  
WAC 296-806-410.  
Compactors  
WAC 296-806-415.  
Conveyors  
WAC 296-806-420.  
Food processing equipment  
WAC 296-806-425.  
Forging machines  
WAC 296-806-430.  
Garbage (waste) disposals  
WAC 296-806-435.  
Glue spreaders  
WAC 296-806-440.  
Ironworkers  
WAC 296-806-445.  
Lathes  
WAC 296-806-450.  
Mechanical power presses  
WAC 296-806-455.  
Mills  
WAC 296-806-460.  
Press brakes  
WAC 296-806-465.  
Roll-forming and bending machines

WAC 296-806-470.

Sanding machines

WAC 296-806-475.

Saws and cutting heads

WAC 296-806-480.

Sewing machines

WAC 296-806-485.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-400, filed 6/29/04, effective 1/1/05.]

**ABRASIVE WHEELS****WAC 296-806-405 Summary.**

• In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards.

• Requirements for all machines, WAC 296-806-200 and 296-806-300.

• You need to refer to Portable power tools, chapter 296-807 WAC for requirements relating to hand-held abrasive wheel tools.

This section applies to machines that are not hand held and that use an abrasive wheel.

**Definition:**

An *abrasive wheel* is a grinding tool consisting of bonded abrasive grains. This includes diamond and reinforced wheels.

**Your responsibility:**

To make sure abrasive wheel machines and wheels are safe to use.

**You must:****GENERAL REQUIREMENTS FOR ABRASIVE WHEELS**

Make sure abrasive wheels and machines are properly designed and constructed

WAC 296-806-40502.

Make sure machines have safety guards

WAC 296-806-40504.

Make sure safety guards meet specific requirements

WAC 296-806-40506.

Provide a tongue guard on bench, pedestal, floorstand, and cylindrical grinders

WAC 296-806-40508.

Use a work rest for off-hand grinding

WAC 296-806-40510.

**MOUNTING ABRASIVE WHEELS**

Make sure abrasive wheels are safe to use

WAC 296-806-40512.

Mount wheels properly

WAC 296-806-40514.

Use proper flanges

WAC 296-806-40516.

Make sure flanges are in good condition

WAC 296-806-40518.

Use specific flanges for Type 1 cutting-off wheels

WAC 296-806-40520.

Use specific flanges for Type 27A cutting-off wheels

WAC 296-806-40522.

Use blotters when required

WAC 296-806-40524.

Meet specific blotted requirements when using modified Types 6 and 11 wheels (terrazzo)

WAC 296-806-40526.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-405, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40502 Make sure abrasive wheels and machines are properly designed and constructed.**

**You must:**

- Make sure abrasive wheels and machines, including safety guards and flanges, manufactured on or after January 1, 2005, meet the design and construction requirements of American National Standards Institute (ANSI) B7.1-2000, Safety Requirements for the Use, Care and Protection of Abrasive Wheels.

- Make sure abrasive wheels and machines, including safety guards and flanges, manufactured before January 1, 2005, meet the design and construction requirements of American National Standards Institute (ANSI) B7.1-1970, Safety Code for the Use, Care and Protection of Abrasive Wheels.

**Note:** There may be a statement on the machine or in the instruction manual that the machine meets the appropriate ANSI standard. If in doubt, check with the manufacturer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40502, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40504 Make sure machines have safety guards.**

**You must:**

- Use abrasive wheels only on machines that have safety guards.

- Make sure the safety guard:

- Is mounted so it maintains proper alignment with the wheel.

- Is mounted with fasteners strong enough to keep the guard in position if a wheel breaks.

- Covers the spindle end, nut, and flange projections.

**Exemption:** Safety guards are not required on machines that use:

- Wheels for internal grinding while advancing, retracting or within the work.

- Types 16, 17, 18, 18R, and 19 cones and plugs and threaded hole pot balls where either:
  - The work offers protection;

**OR**

- The size does not exceed three inches in diameter by five inches long.

- Notched, segmented, or continuous rim metal centered diamond lapidary wheels that are:

- Used with a coolant deflector;

**AND**

- Operated at 3,500 SFPM or less.

- Type 1 reinforced wheels that are:

- Three inches or less in diameter.

- One-fourth inch or less thick.

- Operating at peripheral speeds of 9,500 SFPM or less.

- Used by operators wearing safety glasses and face shields.

- Valve seating grinding wheels.

- Remotely operated machines in an enclosure that will retain the pieces of a broken wheel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40504, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40506 Make sure safety guards meet specific requirements.**

**You must:**

- Make sure the machine safety guards meet the requirements of Table 405-1, Guard Requirements.

**Definition:**

Maximum exposure angle is the largest part of a wheel that does not need to be covered by a safety guard.

**Note:**

- The maximum exposure angle is measured by lines starting at the center of the spindle and extending to the ends of the guard at the wheel periphery.
- Visors and other accessory equipment are used in determining the size of the guard opening only if they are at least as strong as the safety guard.

**Table 405-1  
Guard Requirements**

Machine	Maximum exposure angle and other guard restrictions
Bench, pedestal, or floorstand grinders	<ul style="list-style-type: none"> <li>• Not higher than sixty-five degrees above the horizontal centerline of the wheel</li> <li>• One-fourth (ninety degrees) of the wheel for grinding done at or above the horizontal centerline of the wheel</li> <li>• One hundred twenty-five degrees if the work has to contact the wheel below the horizontal centerline of the wheel</li> </ul>
Cylindrical grinders	<ul style="list-style-type: none"> <li>• One-half (one hundred eighty degrees) of the wheel</li> <li>• Not higher than sixty-five degrees above the horizontal centerline of the wheel</li> </ul>
Surface grinders	<ul style="list-style-type: none"> <li>• One hundred fifty degrees of the wheel</li> <li>• Not higher than fifteen degrees below the horizontal</li> </ul>
Cutting-off machines	<ul style="list-style-type: none"> <li>• One-half (one hundred eighty degrees) of the wheel</li> </ul>
Swing frame grinders	<ul style="list-style-type: none"> <li>• One-half (one hundred eighty degrees) of the wheel</li> <li>• Encloses the top one-half of the wheel</li> </ul>
Swing frame grinders using cup wheels	<ul style="list-style-type: none"> <li>• One-half (one hundred eighty degrees) of the wheel</li> <li>• Covers the wheel on the side towards the operator</li> </ul>
Semiautomatic snagging machines	<ul style="list-style-type: none"> <li>• One-half (one hundred eighty degrees) of the wheel</li> <li>• Covers the wheel on the side towards the operator</li> </ul>
Machines used for top grinding	<ul style="list-style-type: none"> <li>• As small as possible up to one-sixth (sixty degrees) of the wheel</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40506, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40508 Provide a tongue guard on bench, pedestal, floorstand, and cylindrical grinders.**

**You must:**

- Make sure, if the operator stands in front of the opening in the safety guard, that the safety guard (tongue guard) at the top of the opening is adjusted to within one-fourth inch of the wheel.

**Definition:**

The tongue guard is an integral part of a safety guard that is located where the upper exposed part of the abrasive wheel meets the safety guard. It can be adjusted as necessary to maintain a set distance from the constantly decreasing diameter of the wheel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40508, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40510 Use a work rest for off-hand grinding.**

**Exemption:** You do not need to use a work rest if:

- The size, shape, weight or finishing area of the workpiece prevents its use;

**OR**

- Contact with the grinding wheel below the horizontal plane of the spindle is necessary.

**You must:**

- Use a work rest to support the work.
- Make sure the work rest is:
  - Rigidly constructed.
  - Adjustable to compensate for wheel wear.
  - Adjusted only when the wheel is stopped.
  - Securely clamped after each adjustment.
  - Kept within one-eighth inch of the wheel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40510, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40512 Make sure abrasive wheels are safe to use.****You must:**

- Do the following before mounting a wheel:
  - Visually inspect the wheel for cracks or damage.
  - Perform a ring test for cracks if the size and shape of the wheel permits testing.
  - Make sure the spindle speed of the machine is not greater than the operating speed of the wheel.
- Make sure a damaged or cracked wheel is not mounted or used.

**Note:** Wheels that have gouges, grooves, other damage, or material buildup on the grinding surface need to be dressed or trued to correct the problem. Wheels that cannot be trued are considered damaged and cannot be used.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40512, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40514 Mount wheels properly.****You must:**

(1) Make sure wheels fit freely on the spindle, wheel sleeves, or adaptors, and remain free under all grinding conditions.

(2) Make sure wheel, blotter and flange surfaces that contact each other are flat and free of foreign particles.

(3) Make sure any reducing bushing used in the wheel hole:

- Fits freely on the spindle and maintains proper clearance;

**AND**

(2007 Ed.)

- Does not exceed the width of the wheel or contact the flanges.

(4) Make sure that multiple wheels mounted between a single set of flanges are either:

- Cemented together;

**OR**

- Separated by spacers that have a diameter and bearing surface that is the same as the mounting flanges.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40514, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40516 Use proper flanges.****You must:**

- Mount all abrasive wheels between flanges that have a diameter at least one-third the diameter of the wheel.

**Exemption:** This flange requirement does not apply to the following wheels:

- Mounted wheels (wheels permanently bonded to a shaft or mandrel).
- Abrasive disc wheels (inserted nut, inserted washer and projecting stud type).
- Plate mounted wheels.
- Cylinder, cup, or segmental wheels mounted in chucks.
- Types 27, 28, and 29 wheels.
- Internal wheels less than two inches in diameter.
- Modified Type 6 and 11 wheels (terrazzo).
- Types 1 and 27A cutting-off wheels.

**You must:**

- Make sure flanges are:
    - Dimensionally accurate.
    - Properly balanced.
    - Flat.
    - Free of rough surfaces or sharp edges.
  - Make sure the driving flange is:
    - Part of the spindle;
- OR**
- Securely fastened to the spindle.
  - Make sure, if a wheel is mounted between two flanges, that both flanges:
    - Are the same diameter;
- AND**
- Have equal bearing surfaces.

**Exemption:** The following wheels do not require same diameter, equal bearing surface flanges:

- Types 27, 28, and 29 wheels with adaptors.
- Modified Types 6 and 11 wheels with tapered K dimension.
- Internal wheels less than two inches in diameter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-40516, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40518 Make sure flanges are in good condition.****You must:**

- Make sure flange bearing surfaces are in good condition.
  - Replace or remachine a flange with a mounting surface that has any of the following problems:
    - Warped.
    - Burred on the bearing surface.
    - Excessively worn (thickness or diameter).
    - Out of true.

[Title 296 WAC—p. 2767]

**Reference:** Flanges that are refaced or trued need to satisfy minimum dimension requirements specified in Safety Requirements for the Use, Care and Protection of Abrasive Wheels, ANSI B7.1-2000.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-40518, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40520 Use specific flanges for Type 1 cutting-off wheels.**

**You must:**

- Mount Type 1 cutting-off wheels between flanges that are:
  - Properly relieved with matching bearing surfaces.
  - At least one-fourth the wheel diameter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-40520, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40522 Use specific flanges for Type 27A cutting-off wheels.**

**You must:**

- Mount Type 27A cutting-off wheels between flanges that are:
  - Flat (unrelieved) with matching bearing surfaces;

**AND**

- At least one-fourth the wheel diameter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-40522, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40524 Use blotters when required.**

**Exemption:** You do not need to use a blotter with any of the following:

- Mounted wheels (wheels permanently bonded to a shaft or mandrel).
- Abrasive disc and Type 2 wheels which are mounted by inserted nuts, inserted washers, or projecting studs.
- Plate mounted wheels.
- Wheels mounted in chucks (such as cylinders and segmental wheels).
- Types 27, 28, and 29 wheels.
- Type 1 and Type 27A cutting-off wheels.
- Internal wheels less than two inches in diameter.
- Diamond and cubic boron nitride wheels with metal or carbon fiber cores.

**You must:**

- Use a blotter between each flange and the abrasive wheel surface to uniformly distribute flange pressure.
- Make sure the blotter covers the entire flange contact area.
- Use a new blotter each time a wheel is mounted unless the wheel has a blotter already attached to it by the manufacturer.
- Make sure scuffed or damaged blotters are not used.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-40524, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-40526 Meet specific blotter requirements when using modified Types 6 and 11 wheels (terrazzo).**

**You must:**

- Apply the blotter to the flat side only when mounting Modified Types 6 and 11 wheels (terrazzo).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-40526, filed 6/29/04, effective 1/1/05.]

[Title 296 WAC—p. 2768]

## Calenders

**WAC 296-806-410 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies only to hazards associated with calenders in the rubber and plastics industry where two or more metal rolls are set vertically and revolving in opposite directions.

**Your responsibility:**

To protect employees from hazards associated with calenders.

**You must:**

Provide calender safety controls

WAC 296-806-41002.

Follow these stopping limit requirements for calenders

WAC 296-806-41004.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-410, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-41002 Provide calender safety controls.**

**Exemption:** These rules do not apply to calenders if the machinery is permanently set up so employees:

- Cannot reach through, over, under, or around to come in contact with the roll bite;

**OR**

- Cannot be caught between a roll and nearby objects.

**You must:**

(1) Provide a safety trip control for the face of the calender that meets **all** of the following:

- Provided in front and back of each calender.
- Is accessible.
- Operates readily upon contact.

(2) Provide **at least one** of the following safety trip controls for the face of the calender:

- Safety trip rods, tripwire cables or wire center cords that:

- Are within reach of the operator and the bite (nip point).

- Operate whether pushed or pulled.

- Are located across each pair of in-running rolls extending the length of the face of the rolls.

- Pressure sensitive body bars that:

- Are approximately forty inches vertically above the working level.

- Are horizontally at thirty-four inches from the in-running nip point.

- Operate readily by pressure of the mill operator's body.

(3) Include safety trip rods, cables or cords, in addition to the pressure sensitive body bars, if **both** of these apply:

- In-running rolls are located below the bar;

**AND**

- The operator needs to duck under the bar.

(4) Provide a safety cable or wire center cord on both sides of the calender that:

- Operates readily when pushed or pulled.

- Is connected to the safety trip.

- Note:**
- The center cord should be **all** of the following:
    - Twelve inches or less from the faces of the individual rolls.
    - At least two inches from the calender frame.
    - Anchored to the frame not more than six inches from the floor or operator's platform.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-41002, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-41004 Follow these stopping limit requirements for calenders.**

**You must:**

- Make sure that calenders are stopped within one and three-quarters percent of the fastest speed at which they operate when empty.
  - When calenders operate at more than two hundred fifty feet per minute, stopping distances above one and three-quarters percent of their fastest speed are allowed, but must have engineering support.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-41004, filed 6/29/04, effective 1/1/05.]

## **COMPACTORS**

**WAC 296-806-415 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to all stationary compactors in your workplace.

**Your responsibility:**

To protect employees from hazards associated with stationary compactors.

**You must:**

Safeguard hazardous moving parts of stationary compactors

WAC 296-806-41502.

Follow these requirements for compactor controls

WAC 296-806-41504.

Follow these requirements for compactor access doors and covers

WAC 296-806-41506.

Follow these requirements for compactors that cycle automatically

WAC 296-806-41508.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-415, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-41502 Safeguard hazardous moving parts of stationary compactors.**

**You must:**

- Prevent the compactor from operating while employees have any body parts in the compactor or hazard area.
- Provide a safeguarding method that prevents employees from putting hands, fingers, or any body part into the compactor during operation.

**Note:** Examples of safeguarding methods include:

- Making sure the compactor will not compact material while the gate or door is open.
- Installing a guard, loading hopper, or enclosure at least forty-two inches high that prevents:

- Entry of hands, fingers, or any body part into the loading chamber during operation.
- An operator from being caught between moving parts of the equipment and material.
- The creation of any hazard between the guard and moving parts.

• You may also provide sustained manual pressure controls located so the operator cannot reach, but can still see, the point of operation if a guard is not used.

**Reference:** For additional requirements when adjusting or clearing jams from compactors, see Lockout/tagout (control of hazardous energy), chapter 296-803 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-41502, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-41504 Follow these requirements for compactor controls.**

**You must:**

- Follow these requirements for compactor controls:
  - Each control must have its function clearly labeled.
  - Controls must be designed and located to prevent them from unintentionally activating.
    - Electric stop buttons, including emergency stop buttons, must be:

- Red in color, distinguishable from all other controls by size, and not recessed.

- Emergency stop controls must be either:

- Readily accessible to the operator;

**OR**

- Located within three feet (91.4 cm) of the point of operation or feed area **or** if chute fed, within three feet (91.4 cm) of the access door.

- An electrical disconnect must be located within sight, no more than fifty feet (1,524 cm), from the operating control panel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-41504, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-41506 Follow these requirements for compactor access doors and covers.**

**You must:**

- Make sure access covers meet at least one of the following:

- Interlocked.
  - Secured by a lockable device.
  - Removable by hand tools only.

- Make sure any loading chamber access door has an interlock system that prevents cycling motion when the door is open.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-41506, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-41508 Follow these requirements for compactors that cycle automatically.**

**You must:**

- Use automatic cycling controls only on compactors where the loading chamber is located so that it cannot be accessed during operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-41508, filed 6/29/04, effective 1/1/05.]

## CONVEYORS

**WAC 296-806-420 Summary.** If your specific conveyor or operation is not listed here, then follow any general requirements in this section along with the "Requirements for all machines" found in this chapter, WAC 296-806-200 and 296-806-300.

This section applies to hazards related to conveyors and conveying systems, including bulk material, package, or unit handling types. These requirements are designed to protect employees operating, maintaining, cleaning, and working around conveyors.

**Exemption:** This section does not apply to conveyor systems used primarily for moving people.

### Your responsibility:

To make sure all conveyors in your workplace are constructed, operated, and maintained in a safe manner.

### You must:

#### GENERAL REQUIREMENTS FOR CONVEYORS

Follow these requirements for conveyors

WAC 296-806-42002.

Provide emergency stops on conveyors

WAC 296-806-42004.

Label conveyor controls

WAC 296-806-42006.

Prohibit riding on conveyors

WAC 296-806-42008.

Provide safe access to conveyors

WAC 296-806-42010.

Provide backstop or antirunaway devices to incline, decline, or vertical conveyors

WAC 296-806-42012.

Make only safe alterations to conveyors

WAC 296-806-42014.

Inspect and replace worn conveyor parts

WAC 296-806-42016.

Follow these requirements for replacing conveyor parts

WAC 296-806-42018.

Follow these requirements for spill guards

WAC 296-806-42020.

Provide pedestrian overpasses for conveyors

WAC 296-806-42022.

Guard openings to hoppers and chutes

WAC 296-806-42024.

Install guideposts

WAC 296-806-42026.

#### BELT CONVEYORS

Guard nip points on belt conveyors

WAC 296-806-42028.

Install emergency stop controllers on overland belt conveyors

WAC 296-806-42030.

Install belt conveyor overpasses

WAC 296-806-42032.

#### CHAIN CONVEYORS

Safeguard chain conveyors

WAC 296-806-42034.

Guard return strands on chain conveyors

WAC 296-806-42036.

Guard chain conveyors that are used as a transfer mechanism

WAC 296-806-42038.

#### ELEVATOR CONVEYORS

Prevent material from falling off of elevator conveyors

WAC 296-806-42040.

#### INCLINED RECIPROCATING CONVEYORS (SHAKERS)

Provide protection where employees must load shakers

WAC 296-806-42042.

Provide grating over silo and bunker openings for shuttle conveyors

WAC 296-806-42044.

#### MOBILE CONVEYORS

Guard wheels and rails on mobile conveyors

WAC 296-806-42046.

Prevent hazardous motion on mobile conveyors

WAC 296-806-42048.

Provide a detector for mobile conveyors

WAC 296-806-42050.

Provide safe access on mobile conveyors

WAC 296-806-42052.

#### PUSHER-BAR CONVEYORS

Guard pusher-bar conveyors

WAC 296-806-42054.

#### ROLLER CONVEYORS

Prohibit walking on roller-type conveyors

WAC 296-806-42056.

Use speed controls for roller and wheel conveyors

WAC 296-806-42058.

Safeguard belt-driven live roller conveyors

WAC 296-806-42060.

#### SCREW CONVEYORS

Guard screw conveyors

WAC 296-806-42062.

#### SKIP HOISTS

Provide slack-cable switches on hoists

WAC 296-806-42064.

Block the skip bucket and counterweight guides

WAC 296-806-42066.

Protect against wire rope coming off sheaves

WAC 296-806-42068.

#### SLAT AND ROLLER-SLAT CONVEYORS

Safeguard slat and roller-slat conveyors

WAC 296-806-42070.

#### TOWED CONVEYORS

Provide a safe method for disengaging the tow pin

WAC 296-806-42072.

Protect employees from moving carts on towed conveyors

WAC 296-806-42074.

Provide clearances and warnings for carts on towed conveyors

WAC 296-806-42076.

Mark projections above the floor

WAC 296-806-42078.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-420, filed 6/29/04, effective 1/1/05.]

## GENERAL REQUIREMENTS FOR CONVEYORS

**WAC 296-806-42002 Follow these requirements for conveyors.**

**You must:**

- Construct, operate, and maintain all conveyors according to this chapter and the American National Standards Institute (ANSI) B20.1-1957.

- Make sure all new conveyors constructed after January 1, 2005, meet the requirements of the American Society of Mechanical Engineers (ASME) B20.1-1996.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42002, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42004 Provide emergency stops on conveyors.**

##### **You must:**

- Make sure each conveyor has an emergency stopping device such as an emergency stop button, pull cord, or similar device.

- Make sure each emergency stopping device meets **all** of the following requirements. They must:

- Stop the conveyor a safe distance from the hazard.

- Be easily identified.

- Directly control that conveyor.

- Require a manual reset.

- NOT be overridden from another location.

- NOT require other equipment to be stopped in order to stop the conveyor.

- Make sure where there is the possibility of an employee falling onto a conveyor, that the emergency stopping device for conveyors feeding or dumping into a hazardous machine such as a barker, saw, hog, or chipper is **at least one** of the following:

- Under the continuous control of an operator who cannot fall onto the conveyor and has full view of the material entrance;

##### **OR**

- Located where it can be reached from a sitting position on the conveyor where it feeds or dumps into the hazardous machine.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42004, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42006 Label conveyor controls.**

##### **You must:**

- Clearly label the function of each conveyor control.

**Note:** Controls and wiring that are no longer used should be removed from control stations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42006, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42008 Prohibit riding on conveyors.**

##### **You must:**

- Prohibit employees from riding on conveyors.

**Exemption:** You do not need to prohibit riding on an assembly conveyor moving eighty feet or less per minute or a conveyor with a station specifically designed for operating personnel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42008, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42010 Provide safe access to conveyors.**

##### **You must:**

(2007 Ed.)

- Provide a way to safely inspect and maintain conveyors located more than seven feet from the floor.

**Reference:** Some additional requirements for protecting employees inspecting and maintaining conveyors can be found in:

- Lockout/tagout (control of hazardous energy), chapter 296-803 WAC.

- Personal fall arrest systems, WAC 296-24-88050.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42010, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42012 Provide backstop or antirunaway devices on incline, decline, or vertical conveyors.**

##### **You must:**

- Make sure all incline, decline, or vertical conveyors use backstop or antirunaway devices when there is a danger of conveyor reversal or runaway.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42012, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42014 Make only safe alterations to conveyors.**

##### **You must:**

- Make sure, when making conveyor alterations, that you do not affect safety characteristics such as emergency stop controls, guards, or the incline of the conveyor, if such changes would create a danger to workers.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42014, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42016 Inspect and replace worn conveyor parts.**

##### **You must:**

- Carefully inspect and replace any conveyor part that shows signs of significant wear before it becomes a hazard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42016, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42018 Follow these requirements for replacing conveyor parts.**

##### **You must:**

- Make sure replacement conveyor parts are equal to or exceed the manufacturer's specifications.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42018, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42020 Follow these requirements for spill guards.**

##### **You must:**

- Install protective or spill guards wherever conveyors pass next to or over working areas or passageways.

- These guards must be designed to catch and hold any materials that may become dislodged or fall off.

**Reference:** For specific requirements when conveyors pass over emergency exit routes, see Exit routes, WAC 296-800-310.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42020, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42022 Provide pedestrian overpasses for conveyors.**

##### **You must:**

[Title 296 WAC—p. 2771]

- Provide a pedestrian overpass covering the full width of a passageway if **one** of these conditions exists:
  - The working strand of a conveyor crosses within three feet of floor level.
  - Workers must step over the strand and trough at or below floor level.
- Provide a pedestrian overpass where workers cannot pass under the conveyor safely.
  - The sides of the crossing platform must have standard railings if **one** of the following exists:
    - The overpass is more than four feet high.
    - The conveyor feeds a dangerous machine such as saws, chippers, hogs, or galvanizing tanks.

**Reference:** For guardrail requirements see, Railing, toeboards, and cover specifications, WAC 296-24-75011.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42022, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-42024 Guard openings to hoppers and chutes.

**You must:**

- Guard all openings to hoppers, chutes, and elevator-type conveyors to prevent workers from:
  - Falling or stepping into them.
  - Making any kind of bodily contact with conveyors.

**Note:** Grating provided at floor level with no openings larger than two inches (50 mm) that is strong enough to withstand any load of personnel or trucks that may be imposed upon it is acceptable guarding.

**You must:**

- Do **all** of the following when dumping operations use chutes or hoppers that are flush with the floor and their use cannot be guarded:
  - Place a temporary guardrail around ground or floor-level hoppers when dumping operations are **not** in progress.
  - Post warning signs in a conspicuous location alerting personnel to the presence of an open pit in order to protect employees when dumping operations are in progress.

**Reference:** For guardrail requirements see, Railing, toeboards, and cover specifications, WAC 296-24-75011.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42024, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-42026 Install guideposts.

**You must:**

- Install guideposts to direct employees driving trucks, loaders, or other equipment to the pit, hopper, or chute.

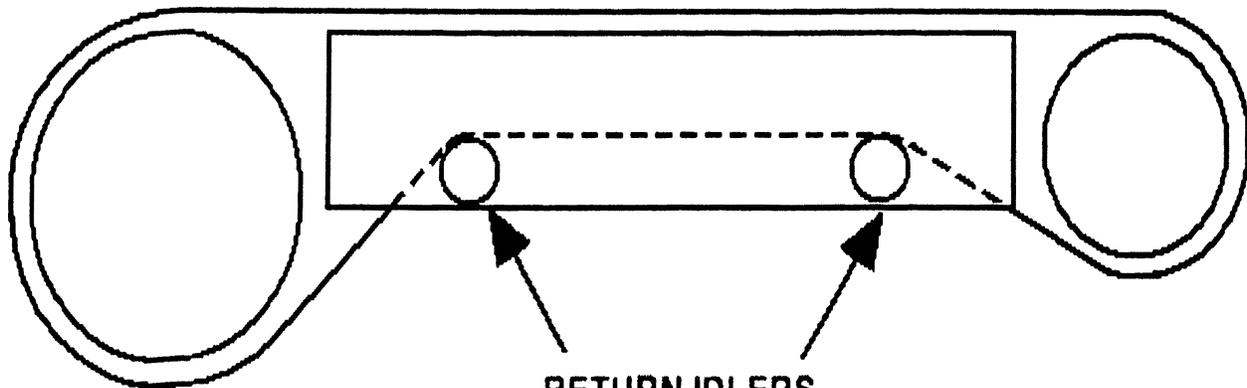
[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42026, filed 6/29/04, effective 1/1/05.]

## BELT CONVEYORS

### WAC 296-806-42028 Guard nip points on belt conveyors.

**Exemption:** This rule does not normally require guards along the conveyor at the point where the belt rides on return rollers, such as return-belt idlers, unless hazardous conditions such as long, tight heavy belts exist.

#### Return-belt idlers



### RETURN IDLERS

These turn freely and just idle.

**You must:**

- Place nip point guards at **all** of these points:
  - Where the belt wraps around the pulley.
  - At terminals, take-ups, and snub rollers where the belt changes directions at transfers and deflectors.
  - At the discharge end.
  - At other points where workers may be injured by nip or shear points.

**Note:** The practice of applying a belt dressing or other foreign material to a rotating drive pulley or a conveyor belt is hazardous and should be avoided.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42028, filed 6/29/04, effective 1/1/05.]

[Title 296 WAC—p. 2772]

### WAC 296-806-42030 Install emergency stop controllers on overland belt conveyors.

**You must:**

- Install permanent emergency pull cords or similar emergency stop controllers at points where workers are normally stationed along overland belt conveyors.

**Note:** Personnel that patrol overland belt conveyors may use portable emergency stop controllers instead of permanently installed pull cords and push-button stations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42030, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-42032 Install belt conveyor overpasses.

**You must:**

- Install a pedestrian overpass or underpass along the sides of long overland belt conveyors, where there is the most foot traffic.

- The distance between overpasses should not exceed three hundred meters or one thousand feet.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42032, filed 6/29/04, effective 1/1/05.]

### CHAIN CONVEYORS

#### **WAC 296-806-42034 Safeguard chain conveyors.**

##### **You must:**

- Provide safeguards for drive, tail, and idler sprocket pulleys where the chain creates a nip or shear point.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42034, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42036 Guard return strands on chain conveyors.**

##### **You must:**

- Provide a way to catch and support the ends of a chain that break over a passageway.

- Provide a strong enough trough to carry the weight from a broken chain on conveyors when return strands operate within seven feet of the floor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42036, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42038 Guard chain conveyors that are used as a transfer mechanism.**

##### **You must:**

- Guard chain conveyors whose moving chains cannot be enclosed without impairing their function by **one** of the following methods:

- Distance as required in, Make sure safeguarding by distance meets these requirements, WAC 296-806-20056.

- Personnel barriers.

- Warning signs where personnel barriers are not practical.

**Note:** Chain conveyors with moving chains that cannot be enclosed include those:

- Mounted within another conveyor.
- Raised and lowered as a transfer mechanism.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42038, filed 6/29/04, effective 1/1/05.]

### ELEVATOR CONVEYORS

#### **WAC 296-806-42040 Prevent material from falling off of elevator conveyors.**

##### **You must:**

- Install strong guards, screens, or barricades to prevent material from falling in any direction into the shaft way of elevator-type conveyors, except at loading and unloading areas.

- Install automatic shaft way gates or suitable barriers at each floor level where material is loaded or unloaded.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42040, filed 6/29/04, effective 1/1/05.]

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### INCLINED RECIPROCATING CONVEYORS (SHAKERS)

#### **WAC 296-806-42042 Provide protection where employees must load shakers.**

##### **You must:**

- Provide standard guardrails or snap chains along loading sides of the shaker where personnel must load or unload material.

- Snap chains must be at least thirty-nine inches high at their lowest point.

- Make sure controls are located so the conveyor cannot be started by an employee on the moving part of the conveyor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42042, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42044 Provide grating over silo and bunker openings for shuttle conveyors.**

##### **You must:**

- Provide grating with openings to match the size of the material being discharged into silos or bunkers. Make sure openings are:

- Small enough so that workers cannot fall through.

- Protected by other effective means if the material size requires openings large enough for a worker to fall through.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42044, filed 6/29/04, effective 1/1/05.]

### MOBILE CONVEYORS

#### **WAC 296-806-42046 Guard wheels and rails on mobile conveyors.**

##### **You must:**

- Install sweeps in front of the nip points created by the wheels and rails to deflect objects that could derail the conveyor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42046, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42048 Prevent hazardous motion on mobile conveyors.**

##### **You must:**

- Make sure mobile conveyors have **at least one** of the following to prevent hazardous motion:

- Brakes.

- Rail clamps.

- Other position-locking devices.

- Provide limit switches that will stop travel when exceeding the design limits of rail-mounted mobile conveyors.

- Provide rail stops to keep the conveyor from traveling past its designed end location.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42048, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-42050 Provide a detector for mobile conveyors.**

##### **You must:**

- Provide a detector to stop conveyor movement when the operation creates a danger of running into a stockpile or other obstacle.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42050, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42052 Provide safe access on mobile conveyors.**

#### **You must:**

- Make sure that access stairways, ladders, and platforms are designed and located to avoid the shear or nip point hazards of the conveyor and moving machinery.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42052, filed 6/29/04, effective 1/1/05.]

## **PUSHER-BAR CONVEYORS**

### **WAC 296-806-42054 Guard pusher-bar conveyors.**

#### **You must:**

- Provide a guard when hazards exist at each of these points:

- At the discharge point where the bar passes through the bed.
- Where there is a shear point between the return pusher bar and a frame member.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42054, filed 6/29/04, effective 1/1/05.]

## **ROLLER CONVEYORS**

### **WAC 296-806-42056 Prohibit walking on roller-type conveyors.**

#### **You must:**

- Prohibit employees from walking on the rolls of roller-type conveyors.

- Tread plates or other types of walkways can be used between the rollers as a walking surface for operators when performing their duties.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42056, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42058 Use speed controls for roller and wheel conveyors.**

#### **You must:**

- Avoid safety hazards created by unit or package speeds by **one** of the following methods:

- Limiting the length of the sloped run.
- Using speed retarders or brakes.
- Other means of providing speed control.

- Make sure rollers and wheels are free running to prevent locked wheels from steering or pulling materials to one side or off the conveyor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42058, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42060 Safeguard belt-driven live roller conveyors.**

#### **You must:**

- Guard belt and roller nip points by **one** of the following methods:

- Space load-carrying rollers to prevent access to the belt and roller nip points.

- Insert rods or plates between the rollers to prevent access to the belt and roller nip points.

- Use rollers that pop out when something contacts the nip point.

- Distance safeguarding found in:

- Distance safeguarding by distance meets these requirements, WAC 296-806-20056.

**Reference:** For nip points and shear hazards on power-driven (live) roller conveyors see, Guard nip points on belt conveyors, WAC 296-806-42028.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42060, filed 6/29/04, effective 1/1/05.]

## **SCREW CONVEYORS**

### **WAC 296-806-42062 Guard screw conveyors.**

#### **You must:**

- Enclose the rotating screw to prevent contact with the shear points where it passes the sides of the trough or casing.

- Guard screw conveyors requiring an open housing by using **one** of the following:

- Make sure safeguarding by distance meets these requirements, WAC 296-806-20056.

- Make sure guardrails used for safeguarding meet these requirements, WAC 296-806-20058.

- Construct feed openings for shovel, front-end loader, or other manual or mechanical equipment so that the conveyor screw is covered by a grating.

- If the nature of the material is such that a grating cannot be used, then the exposed section of the conveyor must be guarded by a railing and warning signs.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42062, filed 6/29/04, effective 1/1/05.]

## **SKIP HOISTS**

### **WAC 296-806-42064 Provide slack-cable switches on hoists.**

#### **You must:**

- Provide and arrange slack cable switches to cut power to the drive and set the brake when the skip or counterweight hoisting ropes either:

- Develop slack;

**OR**

- Lose tension due to sticking in the guides, over travel, or for any other reason.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42064, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42066 Block the skip bucket and counterweight guides.**

#### **You must:**

- Make sure the skip bucket and counterweight are blocked in their guides when the brake or any part of the drive train between the brake and the drum shaft are being repaired or replaced.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42066, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42068 Protect against wire rope coming off sheaves.****You must:**

- Fit all sheaves with sheave guards to prevent the wire rope from coming off under slack cable or similar conditions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42068, filed 6/29/04, effective 1/1/05.]

**SLAT AND ROLLER-SLAT CONVEYORS****WAC 296-806-42070 Safeguard slat and roller-slat conveyors.****You must:**

- Provide **either** of these safeguards at the tail end of a slat conveyor if the slats are above the centerline of the chain:
  - A guard over the hazardous tail end;
- OR**
- Warning signs if guards are impractical because of material flowing over the tail sprocket.

- Provide **either** of these safeguards when there is a gap between the slats wide enough to permit access to cross members below the slats:

- A continuous pan under the slats;

**OR**

- Keep all cross members a safe distance from the slats.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42070, filed 6/29/04, effective 1/1/05.]

**TOWED CONVEYORS****WAC 296-806-42072 Provide a safe method for disengaging the tow pin.****You must:**

- Provide a method for the operator to disengage the tow pin from a conveyor pusher without being in front of the cart.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42072, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42074 Protect employees from moving carts on towed conveyors.****You must:**

- Make sure runaway carts are unable to exit ramps and enter work areas.
  - Have a barrier of sufficient strength and height on ramps with pedestrian or traffic aisles to prevent a runaway cart from entering the aisle.
  - Have signs warning employees not to enter ramps that do not have pedestrian or traffic aisles.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42074, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42076 Provide clearances and warnings for carts on towed conveyors.****You must:**

- Provide clearance space for personnel in **all** of the following:
  - Between the sides of carts.
  - Between any load overhanging the side of a cart.
  - Any fixed or moving object.
  - Identify the cart path with floor stripes that are:
    - Parallel to the cart path.
    - Arranged so one line is on each side of the path.
    - Located a safe distance from the edge of the cart or overhanging load.

- Arranged so one line is on each side of the path.
- Located a safe distance from the edge of the cart or overhanging load.
- Mark reduced clearance areas with appropriate warning signs.

**Note:** An example of a reduced clearance area is an area where a cart goes through a wall opening.

**You must:**

- Place an appropriate warning on those areas where a cart may unexpectedly change direction, such as switching off the main line into a transfer conveyor or a spur.

**Note:** An example of an appropriate warning would be to use diagonal stripes on the floor between clearance lines.

**You must:**

- Install a sign, signal, or other warning where carts start automatically.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42076, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42078 Mark projections above the floor.****You must:**

- Mark the area around projections above the floor with appropriate diagonal stripes, warning signs, or both.

**Note:** This is especially important if projections above the floor are unpredictable or occur intermittently.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42078, filed 6/29/04, effective 1/1/05.]

**FOOD PROCESSING EQUIPMENT**

**WAC 296-806-425 Summary.** If your specific food processing machine or operation is not listed here, then follow any facilities requirements in this section along with the "Requirements for all machines" found in this chapter, WAC 296-806-200 and 296-806-300.

This section applies to:

- All businesses that manufacture or process food, whether or not they are contained inside food stores;

**AND**

- The design, installation, operations, and maintenance of machinery and equipment used in the food processing industry.

**Your responsibility:**

To protect employees from hazards associated with food processing facilities and machines.

**You must:****FACILITIES**

Provide locks on chamber doors of large air conditioning units

WAC 296-806-42502.

Use proper door locks on rack-type bread coolers

WAC 296-806-42504.

Provide see-through panels on fermentation room doors

WAC 296-806-42506.

Cover exposed hot pipes

WAC 296-806-42508.

Provide extension piping on stationary lubrication fittings

WAC 296-806-42510.

Provide hoods for pan-washing tanks

WAC 296-806-42512.

Safeguard proof boxes

WAC 296-806-42514.

Safeguard storage bins

WAC 296-806-42516.

**MATERIAL HANDLING**

Follow these design requirements for bag lifts (bag arm elevators) and chutes

WAC 296-806-42518.

Follow these requirements for chain tackle

WAC 296-806-42520.

Safeguard conveyors

WAC 296-806-42522.

Use properly designed covers for screw conveyors (augers)

WAC 296-806-42524.

Safeguard pallet jacks and hand trucks

WAC 296-806-42526.

**SPECIFIC FOOD PROCESSING EQUIPMENT**

Safeguard bakery slicers

WAC 296-806-42528.

Safeguard bakery wrapping machines

WAC 296-806-42530.

Provide troughs with antifriction-bearing casters

WAC 296-806-42532.

Follow these requirements for trough hoists and similar equipment

WAC 296-806-42534.

Follow these requirements for dividers

WAC 296-806-42536.

Safeguard manually-fed dough and cross-roll brakes

WAC 296-806-42538.

Provide a guard or tripping device on reversible dough brakes

WAC 296-806-42540.

Follow these requirements for doughnut machines

WAC 296-806-42542.

Follow these requirements for dumpbins and blenders

WAC 296-806-42544.

Follow these requirements for flour-handling machines

WAC 296-806-42546.

Follow these requirements for traveling or track-type flour scales

WAC 296-806-42548.

Follow these requirements for food grinders and cutters

WAC 296-806-42550.

Provide covers with interlocks on ingredient premixers, emulsifiers, and similar machines

WAC 296-806-42552.

Follow these requirements for open fat kettles

WAC 296-806-42554.

Follow these requirements for steam kettles

WAC 296-806-42556.

Follow these requirements for chocolate melting, refining, and mixing kettles

WAC 296-806-42558.

Safeguard meat-processing equipment (circular meat-cutting saws)

WAC 296-806-42560.

Follow these requirements for horizontal dough mixers

WAC 296-806-42562.

Follow these requirements for vertical mixers

WAC 296-806-42564.

Follow these requirements for mechanical-feed moulders

WAC 296-806-42566.

Follow these requirements for hand-fed moulders

WAC 296-806-42568.

Design, install, and construct your ovens according to these requirements

WAC 296-806-42570.

Properly locate emergency "stop" buttons and main shut off valves for ovens

WAC 296-806-42572.

Inspect and test safety devices on ovens

WAC 296-806-42574.

Follow these requirements for peanut-cooling trucks

WAC 296-806-42576.

Follow these requirements for pretzel-rolling, pretzel-stick extruding, rotary, and die machines

WAC 296-806-42578.

Safeguard box and roll-type dough sheeters

WAC 296-806-42580.

Provide proper enclosures for sifters

WAC 296-806-42582.

Follow these requirements for sugar and spice pulverizers

WAC 296-806-42584.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-425, filed 6/29/04, effective 1/1/05.]

**FACILITIES**

**WAC 296-806-42502 Provide locks on chamber doors of large air conditioning units.**

**You must:**

- Make sure all door locks on air conditioning unit chambers, that are large enough for employees to enter, can be operated from both inside and outside the chamber.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42502, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42504 Use proper door locks on rack-type bread coolers.**

**You must:**

- Make sure all door locks can be operated from both inside and outside the bread cooler.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42504, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42506 Provide see-through panels on fermentation room doors.**

**You must:**

- Provide shatterproof, see-through panels, made of wire glass or plastic, on fermentation room doors.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42506, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42508 Cover exposed hot pipes.****You must:**

- Cover exposed hot (160°F or more) water and steam pipes with insulating material wherever necessary to prevent employee contact.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42508, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42510 Provide extension piping on stationary lubrication fittings.****You must:**

- Provide extension piping on stationary lubrication fittings to prevent workers from reaching into the hazardous area when lubricating moving machinery.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42510, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42512 Provide hoods for pan-washing tanks.**

**Exemption:** This requirement does not apply to dishwashers or sanitizers used in restaurants or retail establishments.

**You must:**

- Provide power-ventilated exhaust hoods over the tank.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42512, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42514 Safeguard proof boxes.****You must:**

- (1) Make sure all door locks can be operated from both inside and outside the proof box.
- (2) Provide guide rails to center the racks as they enter, pass through, and leave the proof box if pans, boards, or trays may be easily dislodged.

**Note:** Guide rails are not required in proof boxes unless there are two doors with a pass through or pull through design.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42514, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42516 Safeguard storage bins.**

**Exemption:** This requirement does not apply to under-the-counter ingredient bins found in retail stores.

**You must:**

- (1) Provide locks or latches to keep storage bin covers closed, and gaskets or other equivalent devices, to make sure covers are dust tight.
- (2) Make sure employees lock covers in the open position when entering bins.
  - Covers for bins that employees may enter must have a metal fastener (hasp) and lock that can be locked in the "open" position.
- (3) Provide a standard stationary safety ladder on the inside and outside of storage bins with sides more than five feet deep.
  - The ends of ladders must be kept away from moving screw conveyors.
  - Outside ladders must reach from floor level to the top of the bin.
  - Inside ladders must reach from the top of the bin to the bottom of the bin.
- (4) Provide an electric interlock on the main entrance cover of large storage bins near the interior exit ladder.

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- The interlock needs to prevent feed and unloading screw motors from operating while the cover is open.

**Reference:** You may need to follow other requirements found in Confined spaces, chapter 296-811 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42516, filed 6/29/04, effective 1/1/05.]

**MATERIAL HANDLING****WAC 296-806-42518 Follow these design requirements for bag lifts (bag arm elevators) and chutes.****You must:**

- (1) Make sure bag arm elevators with manual takeoff are designed to include:

- Maximum operating capacity of seven bags per minute.
- Spacing of arms on the conveyor chain to obtain the full capacity of the elevator with the lowest possible chain speed.
- An electric limit switch at the unloading end that automatically stops the conveyor chain if any bag does not clear the conveyor arms.

- (2) Make sure bag chutes (gravity chutes for handling flour bags) that incline more than thirty degrees from horizontal:

- Are designed to keep the speed of flour bags as low as possible.
- Provide an upturn at the lower end of the chute to slow down the bags.

- (3) Prohibit the use of bag or barrel lifts as personnel lifts.

- (4) Prohibit manlifts in bakeries.

**Definition:****Manlift**

A device consisting of a power driven endless belt moving in one direction only, and provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42518, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42520 Follow these requirements for chain tackle.****You must:**

- (1) Mark all chain tackle with the maximum load capacity so the marking is:

- Prominently displayed.
- Legible.
- Permanent.

- (2) Mark all chain tackle with minimum support specifications so the marking is legible and permanent.

- (3) Use safety hooks with chain tackle.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42520, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42522 Safeguard conveyors.****You must:**

- (1) Install stop bumpers on all delivery ends of conveyors when products are manually removed.
- (2) Make sure all conveyors have "stop" buttons at all operating stations.
- (3) Provide emergency stop bars or switches at any point where both of these exist:

- The conveyor feeds into a machine;
- AND**
- Pinch points or catching hazards exist.

**Reference:** Additional requirements for conveyors are found in WAC 296-806-420.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42522, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42524 Use properly designed covers for screw conveyors (augers).**

**Exemption:** This requirement does not apply to screw conveyors where there are drop or hinged bottom sections that cannot remain airtight.

**You must:**

- Design covers for screw conveyors that are:
  - Removable in convenient sections.
  - Held in place with stationary clamps.
- Locate stationary clamps at intervals that will keep all covers dust tight.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42524, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42526 Safeguard pallet jacks and hand trucks.**

**You must:**

- (1) Make sure motorized and nonmotorized pallet jacks have a lock or other device that holds the handle in the vertical position when the hand truck is not in use.
- (2) Make sure hand truck casters are set back from corners:
  - Locate them back from corners so they do not present a hazard to employee's toes and heels, but not close enough to cause the hand truck to become unstable.

**Reference:** Motorized hand trucks (pallet jacks) are classified as powered industrial trucks. Additional requirements for powered industrial trucks are found in chapter 296-863 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42526, filed 6/29/04, effective 1/1/05.]

## **SPECIFIC FOOD PROCESSING EQUIPMENT**

### **WAC 296-806-42528 Safeguard bakery slicers.**

**You must:**

- (1) Provide all slicers with a mechanical device to push the last loaf through the slicer knives.
- (2) Equip all slicers with an interlock to deenergize the motor whenever a door, panel, or other point of access to the cutting blades is open.
- (3) Protect employees sharpening blades by installing a barrier guard that provides an opening large enough for the sharpening stone to reach and sharpen slicer blades.
- (4) Provide automatic braking to stop slicers with endless band knives when the motor is not energized.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42528, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42530 Safeguard bakery wrapping machines.**

**You must:**

- (1) Extend or locate mechanical control levers that start and stop slicing machine conveyors and wrapping machines

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so an operator can control both machines from either location.

- Note:**
- The levers should be provided wherever necessary, but arranged so only one station can start the wrapping machine and conveyor assembly.
  - Set up or guard controls to prevent accidental starting.
  - The electronic control station for starting and stopping the electric motor that drives the wrapping machine and conveyor should be near the clutch-starting lever.

**You must:**

- (2) Provide a protective cover plate over electric heaters on bakery wrapping machines.
  - The cover plate must be properly separated or insulated from heaters so the plate itself is not a burn hazard to operators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42530, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42532 Provide troughs with antifriction-bearing casters.**

**You must:**

- Provide antifriction-bearing casters on troughs so operators can move and direct them with minimal effort.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42532, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42534 Follow these requirements for trough hoists and similar equipment.**

**You must:**

- (1) Mark all hoists and similar equipment with the maximum loading capacity so the marking is:
  - Prominently displayed.
  - Legible.
  - Permanent.
- (2) Mark all hoists with minimum support specifications so that the marking is legible and permanent.
- (3) Provide safety catches for the chain so that it will hold the load in any position.
- (4) Use safety hooks with hoists.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42534, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-42536 Follow these requirements for dividers.**

**You must:**

- Enclose or safeguard the moving parts in the back of the divider with **all** of the following:
  - A complete cover to enclose **all** moving parts OR an enclosure or guard for each individual part to remove separate hazards.
  - A limit switch to shut off the machine when the rear cover is open.
  - A hinged guard on the back that cannot be completely removed.
- If a catch or brace is provided for holding the cover open, make sure it will not release due to vibrations or minor bumping, causing the cover to drop on an employee.

**Note:** Dividers as discussed in this section utilize pistons, knives and blades to cut and divide large quantities of dough. This does not apply to small vibrating or oscillating rounders.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42536, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42538 Safeguard manually-fed dough and cross-roll brakes.****You must:**

(1) Guard the top roll with a heavy-gage metal shield that extends over the roll to within six inches of the hopper bottom board.

**Note:** The shield may be perforated to allow observation of the dough entering the rolls.

**You must:**

(2) Provide an emergency "stop" bar that includes a self-engaging brake.

- Locate it so that if the operator falls forward or gets their hands caught in the rolls, their body will press against the bar, causing the rolls to stop instantly by opening the circuit to:

- Deenergize the drive motor.

- Activate a spring-set magnetic brake.

- Activate the emergency "stop" bar before each shift to make sure it is functioning properly.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42538, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42540 Provide a guard or tripping device on reversible dough brakes.****You must:**

- Provide a guard or tripping device on each side of the rolls of reversible dough brakes.

- The guard or device must be designed so that it stops the machine or reverses the direction of the rolls, if moved by the operator.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42540, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42542 Follow these requirements for doughnut machines.****You must:**

- Provide separate flues for venting both of the following:

- Vapors from the frying section;

**AND**

- Products of combustion from the combustion chamber used to heat the fat.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42542, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42544 Follow these requirements for dumpbins and blenders.****Definition:****Dumpbin and blender**

The part of the flour handling system where the containers of flour are emptied.

**You must:**

(1) Make sure dumpbin and blender hoods are large enough to prevent circulation of flour dust outside the hoods.

(2) Provide a stop control device for dumpbins and blenders located close to the operator's work station.

(3) Position dumpbins at an appropriate height from the floor so that operators can dump flour from bags without excessive strain or fatigue.

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(4) Provide a bag rest stop, when the edge of a dumpbin is more than twenty-four inches above the floor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42544, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42546 Follow these requirements for flour-handling machines.****You must:**

- Make sure the following safeguards are used when flour-handling systems are run in electrical unity with one another:

- When the beginning of the system is located far from its final delivery end, make sure:

- All electric motors operating the system have one control at each end;

**AND**

- Either control will stop all motors.

- Arrange control circuits for magnetic controllers so opening **any** limit switch on an individual unit will deenergize **all** motors on that unit.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42546, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42548 Follow these requirements for traveling or track-type flour scales.****You must:**

- Provide bar handles for the moving of traveling or track-type flour scales.

**Note:** For easier grip, the bar should be at least one inch in diameter.

**You must:**

- Guard trolley track wheels.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42548, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42550 Follow these requirements for food grinders and cutters.****You must:**

- Make sure that food grinders and cutters:

- Have an interlock so machines with removable hoppers cannot be operated when the hopper is removed:

- Limit access to hoppers where grid guards cannot be used by providing feed conveyors or baffle-type hoppers. Hoppers must be both:

- Enclosed and provided with hinged covers;

**AND**

- Equipped with an electric interlock so the machine will not operate with the cover open.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42550, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42552 Provide covers with interlocks on ingredient premixers, emulsifiers, and similar machines.****You must:**

- Provide covers that attach to machines that have top openings.

**Note:** The covers should be arranged and interlocked so that power to the machine is shut off when the cover is opened far enough for the operator's fingers to come in contact with the beaters.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42552, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42554 Follow these requirements for open fat kettles.**

**You must:**

- (1) Keep the floor around kettles in nonslip condition.
- (2) Make sure the top of the kettle is at least thirty-six inches above the floor or working level.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42554, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42556 Follow these requirements for steam kettles.**

**You must:**

- (1) Provide positive locking devices to hold kettles in the desired position.

- (2) Provide safety devices for steam kettles according to:

- The American Society of Mechanical Engineers (ASME) Pressure Vessel Code, section VIII, division I, Unfired Pressure Vessels, 2001, Kettles with Steam Jackets.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42556, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42558 Follow these requirements for chocolate melting, refining, and mixing kettles.**

**You must:**

- (1) Provide a cover to enclose the top of the kettle.
- (2) Make sure the bottom outlet of each kettle is designed so the operator cannot:
  - Reach in to touch the revolving paddle.
  - Come in contact with the shear point between the paddle and the side of the kettle.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42558, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42560 Safeguard meat-processing equipment (circular meat-cutting saws).**

**Exemption:** These requirements do not apply to table-top slicers such as those used in delis and restaurants.

**Reference:** When bandsaws are used to cut meat, follow the requirements in, Make sure bandsaws meet these requirements, WAC 296-806-48042.

**You must:**

- (1) Make sure all circular meat-cutting saws have both:
  - Constant pressure controls;

**AND**

- A brake that automatically begins to stop the blade when the switch is released.

- (2) Make sure each circular meat-cutting saw has a protective guard between the operator and the blade.

- (3) Provide suspended, counterbalanced circular meat-cutting saws with guards that cover at least **one** of the following:

- Twenty-five degrees of the blade if the saw has two-hand controls;

**OR**

- Ninety degrees of the blade if the saw can be operated with one hand.

- (4) Provide saws that are not suspended with a guard that covers ninety degrees of the blade.

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**Note:** The size of the guard depends on whether it is suspended or has one- or two-handed controls.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42560, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42562 Follow these requirements for horizontal dough mixers.**

**You must:**

- (1) Make sure mixers are equipped with both of the following:

- An individual motor and control;

**AND**

- A conveniently located manual switch that prevents the mixer from being started during servicing or cleaning.

- (2) Locate electrical control stations so control operators have a full view of bowls in the "open" position.

- These controls, other than a "stop" switch, must not be duplicated.

- (3) Provide mixers with a full enclosure over the bowl that remains closed whenever the agitator is in motion.

- Minor openings in the enclosure during operation, such as ingredient doors and flour inlets, must each be less than one and one-half square feet in area.

**Exemption:** The full enclosure does not have to remain closed if the mixer has a dumping arrangement that provides safety devices where operators must use both hands in either of these situations:

- When the agitator is in motion under power and the bowl is open more than one-fifth of its total opening;

**OR**

- When starting the agitator, if the bowl is open more than one-fifth of its total opening.

**You must:**

- (4) Make sure overhead covers or doors that can accidentally close are either:

- Counterbalanced to remain in the "open" position;

**OR**

- Provided with a catch, brace, or other positive means to hold them open until the operator releases them.

- (5) Locate valves and controls that regulate the coolant in mixer jackets so they can be accessed without creating hazards to the operator.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42562, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42564 Follow these requirements for vertical mixers.**

**You must:**

- (1) Provide a safeguarding device to protect employees from the point of operation, if the nature of the work exposes them to contact with:

- The pinch point where the mixing tool meets the bowl.
- The catching hazard of the mixing tool.

**Note:** When evaluating exposure, the following conditions need to be considered:

- How the mixer functions such as visibility of the agitator or ability to accidentally switch the mixer on.
- How the worker performs operations such as adding ingredients without scraping the bowl or reaching into the bowl when the mixer is in motion.
- How close the worker gets to the hazard during operation.
- The worker's tools, clothing, jewelry, or hair that might get caught or fall into mixer.
- Type of guarding, if any.
- Slipping or tripping hazards in the area.

(2007 Ed.)

**You must:**

(2) Make sure mixers are equipped with both of the following:

- An individual motor and control;

**AND**

• A conveniently located manual switch that prevents the mixer from being started during servicing or cleaning.

(3) Make sure overhead panels or doors on mixers that can accidentally close are either:

- Counterbalanced to remain in an open position;

**OR**

• Provided with catches, braces, or other positive means to hold them open until the operator releases them.

(4) Make sure bowl-locking devices are the type that must be intentionally unlocked by the operator.

(5) Provide devices for moving filled bowls that weigh more than eighty pounds in and out of the mixing position on the machine.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42564, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42566 Follow these requirements for mechanical-feed moulders.****You must:**

• Make sure hoppers for mechanical-feed moulders are designed and connected to the proofer so employee's hands cannot contact the in-running rolls.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42566, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42568 Follow these requirements for hand-fed moulders.****You must:**

(1) Provide hand-fed moulders with **either** of the following, so employee's hands cannot enter the hopper and contact in-running rolls:

• A hopper that can be extended high enough to protect the employee;

– The top edge of the hopper needs to be well rounded to prevent injury when struck or bumped by an employee's hand;

**OR**

- A belt feed device.

(2) Provide **each** of these workers with a stopping device that can be easily reached:

- The operator feeding the moulder.
- The employee taking the dough away from the moulder.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42568, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42570 Design, install, and construct your ovens according to these requirements.****You must:**

• Make sure all ovens manufactured or installed **before** August 13, 1999 meet or exceed ANSI Z50.1-1947 design, manufacturing, and installation requirements.

• Make sure all ovens manufactured or installed on or **after** August 13, 1999 meet the design, manufacturing, and installation requirements in ANSI/NFPA 86-1999.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42570, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42572 Properly locate emergency "stop" buttons and main shut off valves for ovens.****You must:**

(1) Locate emergency stop buttons on mechanical ovens close to where operators are stationed.

(2) Locate main shutoff valves where they can be accessed in case of an emergency.

• Main shutoff valves that permit turning off the fuel or steam in case of an emergency must operate independently of any automatic valves.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42572, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42574 Inspect and test safety devices on ovens.****You must:**

(1) Inspect ovens at least twice a month by a formally appointed, properly trained, bakery employee.

- Include the following in your inspection:

– All safety devices.

– Testing of all safety shutoff valves, making sure they are positively tight.

(2) Make sure a representative of the oven manufacturer performs an annual inspection.

(3) Test all piping on ovens to make sure they are gas tight.

(4) Test oven systems as follows:

• Test duct systems on indirect recirculating ovens that operate under pressure for tightness at the following intervals:

– When the oven is first started.

– At least every six months after that.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42574, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42576 Follow these requirements for peanut-cooling trucks.****You must:**

• Make sure the entire top of the peanut-cooling truck has a grid-type cover.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42576, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42578 Follow these requirements for pretzel-rolling, pretzel stick extruding, rotary, and die machines.****You must:**

• Protect the operator's hands from getting caught in moving parts by doing **at least one** of the following:

– Cover the entire opening of dough hoppers with grid-type guards.

– Extend the hopper higher.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-42578, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42580 Safeguard box and roll-type dough sheeters.****You must:**

(1) Guard exposed rolls with **either** of these methods:  
 • Guard the nip point of exposed sheeting rolls at the point where the dough enters the rolls;

**OR**

• Provide an emergency "stop" bar that extends the length of unguarded rolls that will stop the rolls on contact with the operator, if a barrier guard interferes with machine operation.

(2) Provide a stopping device for hoppers.

• Provide an automatic "stop" bar or stopping device along the back edge of the hopper.

– If machine construction does not allow for this, place the bar or device where it will be most effective.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42580, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42582 Provide proper enclosures for sifters.**

**You must:**

- Make sure enclosures on flour sifters:
  - Are dust tight.
  - Allow for ease of interior inspection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42582, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-42584 Follow these requirements for sugar and spice pulverizers.**

**You must:**

(1) Remove static electricity by grounding all drive belts used in sugar and spice pulverizers by using metal combs.

(2) Follow the National Fire Protection Association (NFPA) 61-1999, standard for pulverizing sugar and spice grinding in order to prevent fires and dust explosions in agricultural and food products facilities.

(3) Provide magnetic separators to reduce fire and explosion hazards.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-42584, filed 6/29/04, effective 1/1/05.]

**FORGING MACHINES**

**WAC 296-806-430 Summary.** If your specific machine or operation is not listed here, then follow any general requirements in this section along with the "Requirements for all machines" found in this chapter, WAC 296-806-200 and 296-806-300.

The requirements in this section apply to machines used in the forming of hot metal, such as hot trimming presses, forging hammers, hot forging presses, upsetters, hot bending and hot metal presses, and equipment used in boltheaded and rivet making, as well as other forging equipment. For specific forging machine requirements, see Table 430-1.

**Exemption:** This section does not apply to cold forging operations.

**Your responsibility:**

To make sure all forging and associated equipment in your workplace are constructed, operated, and maintained in a safe manner.

**You must:**

**GENERAL REQUIREMENTS FOR FORGING MACHINES**

Follow these safety requirements when using lead and lead casts

WAC 296-806-43002.

Properly inspect and maintain forging equipment

WAC 296-806-43004.

Use safety blocks on hammers and presses

WAC 296-806-43006.

Make sure tongs meet these requirements

WAC 296-806-43008.

Protect employees when removing scale

WAC 296-806-43010.

Provide adequate foundations for hammers and presses

WAC 296-806-43012.

Follow these requirements for manually operated valves and switches

WAC 296-806-43014.

**HAMMERS**

Use die keys and shims made of proper-grade material

WAC 296-806-43016.

Provide a safety cylinder head

WAC 296-806-43018.

Provide a shutoff valve

WAC 296-806-43020.

Provide a means for cylinder draining

WAC 296-806-43022.

Follow these requirements for pressure pipes

WAC 296-806-43024.

Follow these requirements when using board hammers

WAC 296-806-43026.

**OTHER FORGE FACILITY EQUIPMENT**

Protect against sparks from saws

WAC 296-806-43028.

**Table 430-1  
Specific Requirements for Forging Machines**

	Steam hammers	Airlift hammers	Board hammers	Saws
<b>WACs needed in addition to those included under "General Requirements for Forging Machines"</b>				
<b>WAC 296-806-43016</b> Use die keys and shims made of proper-grade material	X	X		
<b>WAC 296-806-43018</b> Provide a safety cylinder head	X	X		
<b>WAC 296-806-43020</b> Provide a shutoff valve	X	X		
<b>WAC 296-806-43022</b> Provide a means for cylinder draining	X	X		
<b>WAC 296-806-43024</b> Follow these requirements for pressure pipes	X	X		

	Steam hammers	Airlift hammers	Board hammers	Saws
<b>WAC 296-806-43026</b> Follow these requirements when using board hammers			X	
<b>WAC 296-806-43028</b> Protect against sparks from saws				X

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-430, filed 6/29/04, effective 1/1/05.]

### GENERAL REQUIREMENTS FOR FORGING

**WAC 296-806-43002 Follow these safety requirements when using lead and lead casts.**

**You must:**

- (1) Provide thermostats for heating elements to prevent overheating.
- (2) Provide a means of exhaust for fixed or permanent lead pot installations.
- (3) Provide a covered container to store dross skimings.
- (4) Keep equipment clean, especially from accumulations of yellow lead oxide.

- Reference:**
- For requirements about, Personal protective equipment (PPE), see the Safety and health core rules, WAC 296-800-160.
  - For ventilation requirements when using portable lead pot units, see the General occupational health standards, chapter 296-62 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43002, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43004 Properly inspect and maintain forging equipment.**

**You must:**

- Keep all forge shop equipment in safe operating condition.
- Train personnel in proper inspection and maintenance procedures.
- Establish periodic and regular safety inspections.
- Schedule frequent and regular safety inspections of all guards and point-of-operation protection devices.
- Keep written records of safety inspections that include all of the following:
  - Date of the inspection.
  - Signature of the person doing the inspection.
  - Serial number or other identification for the piece of equipment inspected.
- Safeguard all overhead machinery parts so they do not fly off or fall, if the equipment breaks.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43004, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43006 Use safety blocks on hammers and presses.**

**You must:**

- Use safety blocks on hammers and presses when dies are being changed and maintenance or repair work is being done on the machine.
- Provide safety blocks or wedges that meet or exceed the specifications and dimensions shown in Table 430-2.

**Table 430-2  
Strength and Dimensions for Wood Safety Blocks or Wedges**

Size of timber inches using actual dimensions	4x4	6x6	8x8	10x10	12x12	
Square inches in cross section	16	36	64	100	144	
Minimum allowable crushing strength parallel to grain, p.s.i.	5,000	5,000	5,000	5,000	5,000	<b>Note:</b> Adapted from U.S. Department of Agriculture Technical Bulletin 479. Hardwoods recommended are those whose ultimate crushing strengths in compression parallel to grain are 5,000 p.s.i. (pounds per square inch) or greater.
Maximum static load within short column range	80,000	180,000	320,000	500,000	720,000	<b>Note:</b> Slenderness ratio formula for short columns is $L/d = 11$ , where $L$ = length of timber in inches and $d$ = least dimension in inches; this ratio should not exceed 11.
Safety factor	10	10	10	10	10	
Maximum recommended weight of forging hammer for timber used	8,000	18,000	32,000	50,000	72,000	
Maximum allowable length of timber in inches	44	66	88	100	132	

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43006, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43008 Make sure tongs meet these requirements.****You must:**

• Make sure tongs used with hammers, presses, upsetters, and forging equipment used in boltheaded and rivet making, meet the following requirements:

– They are long enough so the worker can use the tongs without standing behind them, in order to avoid injury, in case of kickback.

– The handle ends are not sharp.

- Note:**
- The worker should be instructed about proper body positions when using tongs.
  - Tongs should be checked periodically to see that they remain at the proper hardness level for the job.
  - Rings or equivalent devices that are used for locking tongs should be inspected periodically to make sure they are safe.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43008, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43010 Protect employees when removing scale.****You must:**

• Protect employees at every hammer and press by:

– Making sure they do not place a hand or arm between the dies by providing them with devices that reach the full length of the die when removing scale. Examples include:

■ Oil swabs.

■ Scale removers.

■ Other devices that remove scale by reaching the full length of the die.

– Stopping flying scale through construction and arrangement of a scale guard that is *of substantial construction* at the back of every hammer and press.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43010, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43012 Provide adequate foundations for hammers and presses.****You must:**

• Provide foundations adequate to support the imposed weight and normal work stress for hammers and presses.

– Hammers and presses must remain on their foundations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43012, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43014 Follow these requirements for manually operated valves and switches.****You must:**

• Make sure all manually operated valves and switches are clearly identified and readily accessible for all of the following:

– Presses.

– Upsetters.

– Forging equipment involved in boltheaded and rivet making.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43014, filed 6/29/04, effective 1/1/05.]

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**HAMMERS****WAC 296-806-43016 Use die keys and shims made of proper-grade material.****You must:**

• Make sure that die keys and shims are made from a grade of material that will not easily crack or splinter.

**Note:** Die keys and shims should not project more than two inches in front and four inches in back of the ram or die.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43016, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43018 Provide a safety cylinder head.****You must:**

• Make sure that every steam, airlift, or air hammer has a safety cylinder head that acts as a cushion if the rod breaks or pulls out of the ram.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43018, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43020 Provide a shutoff valve.****You must:**

• Provide each steam and airlift hammer with a quick-closing emergency valve in the admission pipeline that is distinctly marked and in a convenient location.

– This valve needs to be closed and locked in the "off" position when the hammer is being adjusted, repaired, or serviced, or the dies are being changed.

**Reference:** For requirements about Lockout/tagout (control of hazardous energy), see chapter 296-803 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43020, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43022 Provide a means for cylinder draining.****You must:**

• Provide a means for draining cylinders on steam hammers.

• Provide airlift hammers with both main head and clamp cylinder drains.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43022, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43024 Follow these requirements for pressure pipes.****You must:**

• Provide steam or air pressure piping on power-driven hammers that meets or exceeds the requirements in:

– ANSI B31.1.0-1967, Power Piping, with addenda ANSI B31.1.06-1971, for hammers constructed before January 1, 2005.

– ANSI B31.1.0-2001, Power Piping, with addenda ANSI B31.1.0A-2001, for hammers constructed on or after January 1, 2005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43024, filed 6/29/04, effective 1/1/05.]

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**WAC 296-806-43026 Follow these requirements when using board hammers.****You must:**

- Securely fasten a suitable enclosure to gravity-dropped board hammers to prevent damaged or detached boards from falling.
- Properly secure all major assemblies and fittings that can loosen and fall.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43026, filed 6/29/04, effective 1/1/05.]

**OTHER FORGE FACILITY EQUIPMENT****WAC 296-806-43028 Protect against sparks from saws.****You must:**

- Provide all saws with a sheet metal guard that is positioned to stop sparks.
  - The guard must be constructed of at least one-eighth inch sheet metal.

**Note:** It is advisable to provide all saws with a means to trap sparks below the saw and to use a tank of water below the saw to reduce the fire hazard.

**Reference:** Other saw requirements may be found in, Saws and cutting heads, WAC 296-806-480.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43028, filed 6/29/04, effective 1/1/05.]

**GARBAGE (WASTE) DISPOSALS**

**WAC 296-806-435 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to the hazards associated with garbage (waste) disposals found in the workplace. These requirements are designed to protect employees from hazards associated with the point of operation and flying materials.

**Your responsibility:**

To protect employees from hazards associated with garbage (waste) disposals.

**You must:**

Safeguard garbage waste disposal equipment  
WAC 296-806-43502.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-435, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-43502 Safeguard garbage (waste) disposal equipment.****You must:**

- (1) Protect employees exposed to the hazards of screw conveyor disposals with a properly designed and mounted trimboard cover that remains in place during operation.
- (2) Provide guarding to protect employees from contact with knives or blades of disposal units.
  - The guards need to be strong enough so that an employee's downward thrusting motion will not cause the guard material to open larger than two inches.

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**Reference:**

- You may need to follow additional requirements found in, Make sure guards meet these requirements, WAC 296-806-20042, to keep employees from contacting the knives or blades of disposals.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-43502, filed 6/29/04, effective 1/1/05.]

**GLUE SPREADERS**

**WAC 296-806-440 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to safeguarding and emergency controls used to protect employees from the hazards associated with cleaning and operating glue spreaders.

**Your responsibility:**

To protect employees from hazards associated with glue spreaders.

**You must:**

Provide guards and automatic shutoffs on glue spreaders  
WAC 296-806-44002.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-440, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-44002 Provide guards and automatic shutoffs on glue spreaders.****You must:**

- Enclose the in-running side of glue spreaders, leaving enough space to insert stock.
- Provide an emergency stop control, such as a panic bar or similar device, that can be reached from the infeed and outfeed sides of the spreader to shut off the power in an emergency.

**Note:** You may need two controls to reach the emergency stop control from both the infeed and outfeed sides.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-44002, filed 6/29/04, effective 1/1/05.]

**IRONWORKERS**

**WAC 296-806-445 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to the hazards associated with hydraulic and mechanical ironworkers.

**Your responsibility:**

To protect employees from hazards associated with ironworkers.

**You must:**

Safeguard ironworkers point of operation  
WAC 296-806-44502.

Follow these requirements for adjustable restrictors when safeguarding ironworkers

WAC 296-806-44504.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-445, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-44502 Safeguard ironworkers point of operation.****You must:**

- Safeguard the different operating stations on ironworkers according to requirements for all machines, safeguarding methods, WAC 296-806-20042 through 296-806-20058.

**Exemption:** If the point-of-operation opening is one-fourth inch or less, safeguarding is not required.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-44502, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-44504 Follow these requirements for adjustable restrictors when safeguarding ironworkers.****You must:**

- Use adjustable restrictors for safeguarding only when guards, devices, or awareness barriers are not feasible.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-44504, filed 6/29/04, effective 1/1/05.]

**LATHES**

**WAC 296-806-450 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to the hazards associated with metal and woodworking lathes.

**Your responsibility:**

To protect employees from hazards associated with metal and woodworking lathes.

**METAL LATHES****You must:**

Provide shields or guards on metal lathes for chip or coolant hazards

WAC 296-806-45002.

Safeguard work-holding devices (chucks)

WAC 296-806-45004.

Follow these requirements for chip control and handling

WAC 296-806-45006.

Safeguard power-clamping devices

WAC 296-806-45008.

Restrain extended workpieces on horizontal lathes

WAC 296-806-45010.

**WOODWORKING LATHES**

Guard cutting heads on profile lathes and swing-head lathes

WAC 296-806-45012.

Guard cutting heads on turning lathes

WAC 296-806-45014.

Guard automatic turning lathes

WAC 296-806-45016.

Guard wood lathes used for turning long pieces of stock

WAC 296-806-45018.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-450, filed 6/29/04, effective 1/1/05.]

**METAL LATHES****WAC 296-806-45002 Provide shields or guards on metal lathes for chip or coolant hazards.****You must:**

- Provide a shield or other equally effective guard to prevent chips or coolant from being thrown or splashed on the operator, aisle, or other assigned work area, when exposed to these hazards.

- Examples of guards include permanent chip and coolant shields.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45002, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45004 Safeguard work-holding devices (chucks).****You must:**

- Provide a fixed or movable guard, device, awareness barrier, or peripheral cover over areas exposed to the operator on work-holding devices or chucks when:

- It is in the clamped mode and has parts that extend beyond the outside diameter of the holding device.

- It has an irregular shape to the periphery of its body.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45004, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45006 Follow these requirements for chip control and handling.****You must:**

- Make sure employees' hands do not contact chips that are being generated, such as long stringy chips.

**Note:** Chips may be removed by using things such as tools, pullers, brushes, and shovels.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45006, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45008 Safeguard power-clamping devices.****You must:**

- Protect the operator from the hazards of thrown material when the clamping device does not have adequate pressure to hold the material.

**Note:** • Examples of safeguarding methods include:

- Interlocks.

- Retaining covers:

- That contain the workpiece if it falls or flies out from the clamped work-holding device.

- Visual or audible warnings:

- That are located so they can be seen or heard by the operator in the normal work area, making the operator aware that there is no pressure on the clamp side of the actuator.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45008, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45010 Restrain extended workpieces on horizontal lathes.****You must:**

- Safeguard employees from the hazards of work pieces that extend beyond the edges of the horizontal lathe by:

- Restraining work pieces as needed to prevent whipping;

**AND**

– Isolating work pieces with an awareness barrier, fixed or movable guard, or railing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45010, filed 6/29/04, effective 1/1/05.]

## WOODWORKING LATHES

### WAC 296-806-45012 Guard cutting heads on profile lathes and swing-head lathes.

#### You must:

- Cover all cutting heads on profile lathes, swing-head lathes, and heel-turning machines with a metal guard.
- Make sure guards are made of:
  - Sheet metal at least one-sixteenth inches thick.
  - Cast iron at least three-sixteenth inches thick.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45012, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-45014 Guard cutting heads on turning lathes.

#### You must:

- Install hoods or shields that cover as completely as possible all cutting heads, whether or not they rotate.

**Note:** The hood or shield should be hinged to the machine so it can be moved to make adjustments.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45014, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-45016 Guard automatic turning lathes.

#### You must:

- Install hoods that completely enclose the cutter blades, except at contact points where stock is being cut, on the following types of machines:
  - Shoe last and spoke lathes.
  - Doweling machines.
  - Heel-turning machines.
  - Automatic turning lathes with rotating knives.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45016, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-45018 Guard wood lathes used for turning long pieces of stock.

#### You must:

- Install long, curved guards extending over lathe tops where work pieces are held only between the two centers, to prevent stock from being thrown out of the machine.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45018, filed 6/29/04, effective 1/1/05.]

## MECHANICAL POWER PRESSES

**WAC 296-806-455 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to mechanically powered machines that transmit force to cut, form, or assemble metal or other

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materials through tools or dies attached to or operated by slides.

#### Exemption:

This section does not apply to:

- Power press brakes.
- Hydraulic power presses.
- Pneumatic power presses.
- Slow-acting horizontal mechanical presses with large beds (bulldozers).
- Hot bending and hot metal presses.
- Forging presses and hammers.
- Riveting machines.
- Cold headers and cold formers.
- Eyelet machines.
- High energy rate presses.
- Ironworkers and detail punches.
- Metal shears.
- Powdered metal presses.
- Press welders.
- Turret and plate punching machines.
- Wire termination machines.
- Welding presses.

#### Reference:

- See, Forging machines, for forging press and hammer requirements, WAC 296-806-430.
- See, Ironworkers, for requirements for ironworkers, WAC 296-806-445.
- See, Press brakes, for power press brake requirements, WAC 296-806-465.

#### Your responsibility:

To make sure mechanical power presses meet the requirements of this section.

#### You must:

##### Design and construction

Make sure mechanical power presses are properly designed and constructed

WAC 296-806-45502.

##### Safeguarding

Safeguard presses that use unitized tooling

WAC 296-806-45504.

Protect operators from guidepost hazards

WAC 296-806-45506.

Safeguard the point of operation

WAC 296-806-45508.

Make sure point-of-operation guards are properly designed and constructed

WAC 296-806-45510.

Make sure barrier guards used to safeguard the point of operation meet these requirements

WAC 296-806-45512.

Make sure point-of-operation devices are effective

WAC 296-806-45514.

Make sure presence-sensing devices used to safeguard the point of operation meet these requirements

WAC 296-806-45516.

Make sure pull-back devices used to safeguard the point of operation meet these requirements

WAC 296-806-45518.

Make sure restraint (holdout) devices used to safeguard the point of operation meet these requirements

WAC 296-806-45520.

Make sure two-hand control devices used to safeguard the point of operation meet these requirements

WAC 296-806-45522.

Make sure two-hand trip devices used to safeguard the point of operation meet these requirements

WAC 296-806-45524.

Provide additional safeguards when the operator puts one or both hands into the point of operation

WAC 296-806-45526.

### Operations

Establish a die setting procedure

WAC 296-806-45528.

Handle dies safely

WAC 296-806-45530.

Protect die setters during setup and tryout

WAC 296-806-45532.

Train press operators

WAC 296-806-45534.

Operate mechanical power presses safely

WAC 296-806-45536.

Provide tools and other means to protect press operators

WAC 296-806-45538.

Inspect and maintain presses

WAC 296-806-45540.

Make sure presses and operating practices used in the PSDI mode of operation meet these requirements

WAC 296-806-45542.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-455, filed 6/29/04, effective 1/1/05.]

## DESIGN AND CONSTRUCTION

**WAC 296-806-45502 Make sure mechanical power presses are properly designed and constructed.**

### You must:

- Make sure mechanical power presses manufactured **before** January 1, 2005, meet the requirements of American National Standards Institute (ANSI) B11.1-1971, Safety Requirements for the Construction, Care, and Use of Mechanical Power Presses.

- Make sure mechanical power presses manufactured, reconstructed, or modified **on or after** January 1, 2005, meet the requirements of ANSI B11.1-2001, Safety Requirements for Mechanical Power Presses.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45502, filed 6/29/04, effective 1/1/05.]

## SAFEGUARDING

**WAC 296-806-45504 Safeguard presses that use unitized tooling.**

### You must:

- Safeguard the opening between the top of the punch holder and the face of the slide or striking pad by using properly installed, adjusted, and maintained guards or devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45504, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45506 Protect operators from guide-post hazards.**

### You must:

- Use properly installed, adjusted, and maintained guards or devices to protect operators from the hazards created by:
  - Guideposts separating from their bushings.
  - Similar pinch points between the slide (moving die) and fixed die or press attachments.

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**Exemption:** This requirement does not apply if the opening is one-fourth inch or less, before use.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45506, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45508 Safeguard the point of operation.**

### You must:

- Protect employees from point-of-operation hazards by using properly installed, adjusted, and maintained guards or devices.

**Exemption:** This requirement does not apply if the point-of-operation opening is one-fourth inch or less, before use.

**Note:**

- You may use a combination of guards and devices as long as employees are completely protected from point-of-operation hazards.
- Hand tools used for placing materials into the press, or removing them from the press, are not a substitute for point-of-operation guards or devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45508, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45510 Make sure point-of-operation guards are properly designed and constructed.**

### You must:

- Make sure each guard:
  - Prevents the operator's hands or other body parts from reaching through, over, under, or around the guard into the point of operation.

- Has no opening larger than the maximum permissible openings shown in Table 200-1, Largest Allowable Guard Openings, WAC 296-806-20042.

- Does not create a pinch point between the guard and moving machine parts.

- Uses fasteners that cannot be easily removed by the operator.

- Is easy to inspect.

- Provides the best view of the point of operation for the type of work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45510, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45512 Make sure barrier guards meet these requirements.**

### You must:

- Make sure a fixed barrier guard is attached to a fixed surface such as the stripper, die shoe, press frame, or bolster plate.

- Make sure the interlocked barrier guard:
  - Is attached to a fixed surface such as the press frame or bolster plate.

- Prevents cycling (stroking) of the press when the interlocked section of the guard is not in the protecting position.

- Cannot open until hazardous motion of the slide has stopped.

- Not use the hinged or movable sections of an interlocked barrier guard for manual feeding.

- Make sure an adjustable barrier guard is:
  - Attached to a fixed surface such as the press frame, bolster plate, or die shoe.

- Adjusted only by authorized persons who can apply Table 200-1, Largest Allowable Guard Openings, WAC 296-806-20042.

**Reference:** See, Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526, for additional safeguards that are required if the operator puts one or both hands into the point of operation to feed or remove parts, and the point of operation is protected by a Type B gate or movable barrier device.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45512, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45514 Make sure point-of-operation devices are effective.**

**You must:**

- Make sure point-of-operation devices protect the operator from hazards as shown in Table 455-1, Point-of-Operation Devices.
- Make sure the motor start button is protected against accidental contact.

**Table 455-1  
Point-of-Operation Devices**

Type of device	Type of operator protection that must be provided:
Presence-sensing device (part-revolution clutch press)	If the operator's hands or other body part are in the point of operation: • Prevents initiating a press cycle (stroke); <b>OR</b> • Stops the press during the closing portion of the cycle (stroke)
Presence-sensing device (full-revolution clutch press)	Do <b>NOT</b> use for point-of-operation safeguarding
Pull-back device	As the die closes: • Withdraws the operator's hands if they are located in the point of operation; <b>OR</b> • Prevents the operator from reaching into the point of operation
Restraint (holdout) device	Prevents the operator from reaching into the point of operation at all times
Two-hand control device Two-hand trip device	• Requires operators to use both hands to activate controls that are far enough away from the point of operation so the slide completes the closing portion of the cycle (stroke) or stops before they can reach into the point of operation
Type A gate or movable barrier device	Encloses the point of operation: • Before a press cycle (stroke) can be initiated; <b>AND</b> • Remains closed until slide motion has stopped
Type B gate or movable barrier device	Encloses the point of operation: • Before a press cycle (stroke) can be initiated; <b>AND</b>

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**Table 455-1  
Point-of-Operation Devices**

Type of device	Type of operator protection that must be provided:
	• Remains closed until slide motion has stopped during the closing portion of the cycle (stroke)
Sweep device	Do <b>NOT</b> use for point-of-operation safeguarding

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45514, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45516 Make sure presence-sensing devices used to safeguard the point of operation meet these requirements.**

**You must:**

- Make sure the presence-sensing device is interlocked into the control circuit to prevent or stop slide motion if the operator's hand or other body part is within the sensing field of the device during the downstroke of the press slide.
  - Make sure muting of the device is done only during the upstroke of the press slide.
  - Make sure failure of **any** component of the device:
    - Does not prevent normal stopping action of the press.
    - Prevents initiation of another cycle (stroke) until corrected.
    - Is indicated by the system.
  - Use guards to protect all areas of entry to the point of operation not protected by the presence-sensing device.
  - Make sure the sensing field of the device is located farther from the point of operation than the minimum safety distance as determined by the following formula:

**D = 63 x T**

**Where:**

**D = minimum safety distance (in inches)**

**T = stopping time of the press measured at approximately the 90 degree position of crankshaft rotation (in seconds)**

**Example:** The number in the formula represents the hand speed of the operator (sixty-three inches per second). If your press has a stopping time of one-half second (.5 second), the calculations would be:  
D = 63 x .5 = 31.5  
The sensing field would need to be at least thirty-one and one-half inches from the point of operation.

**Reference:** See, Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526, while feeding or removing parts, for additional safeguards that are required if the operator puts one or both hands into the point of operation to feed or remove parts, and the point of operation is protected by a presence-sensing device.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45516, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45518 Make sure pull-back devices used to safeguard the point of operation meet these requirements.**

**You must:**

- Make sure presses requiring more than one operator have a separate pull-back device for each operator.
- Make sure each pull-back device has attachments:
  - For each of the operator's hands.

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- That are connected to and operated only by the press slide or its attached die.
- That are adjusted to either:
  - Prevent the operator from reaching into the point of operation;

OR

- Withdraw the operator's hands from the point of operation before the dies close.
  - Check each pull-back device that is being used for proper adjustment at these times:
    - At the start of each operator shift.
    - After a new die set-up.
    - When operators are changed.
  - Complete necessary maintenance or repair work before operating the press.

**Reference:** For recordkeeping requirements for maintenance or repair work, see Inspect and maintain presses, WAC 296-806-45540.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-45518, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45520 Make sure restraint (holdout) devices used to safeguard the point of operation meet these requirements.**

**You must:**

- Make sure presses requiring more than one operator have separate restraint devices for each operator.
- Make sure each restraint device has attachments:
  - For each of the operator's hands.
  - That are securely anchored.
  - That are adjusted so the operator cannot reach into the point of operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-45520, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45522 Make sure two-hand control devices used to safeguard the point of operation meet these requirements.**

**You must:**

- Make sure presses that require more than one operator:
  - Have separate two-hand controls for each operator.
  - Need concurrent application of all operators' controls to activate the slide.
- Make sure the slide stops if any operator's hand is removed from a control button.
- Make sure two-hand controls are fixed in position and can be moved only by authorized persons.
- Make sure the controls are located farther from the point of operation than the minimum safety distance as determined by the following formula:

$$D = 63 \times T$$

**Where:**

**D = minimum safety distance (in inches)**

**T = stopping time of the press measured at approximately the 90 degree position of crankshaft rotation (in seconds)**

**Example:** The number in the formula represents the hand speed of the operator (63 inches per second). If your press has a stopping time of one-half second (.5 second), the calculations would be:  
 $D = 63 \times .5 = 31.5$

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The controls would need to be at least 31 1/2 inches from the point of operation.

**Reference:** See, Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526, for additional required safeguards.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-45522, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45524 Make sure two-hand trip devices used to safeguard the point of operation meet these requirements.**

**You must:**

- Make sure presses requiring more than one operator:
  - Have separate two-hand trips for each operator.
  - Need concurrent application of all operators' controls to activate the slide.
- Make sure the two-hand trips are fixed in position and can be moved only by authorized persons.
- Make sure the controls are located farther from the point of operation than the minimum safety distance as determined by the following formula:

$$D = 63 \times T$$

**Where:**

**D = minimum safety distance (in inches)**

**T = the maximum time the press takes for the die to close after the press has been tripped (in seconds)**

**Example:** The number in the formula represents the hand speed of the operator (63 inches per second). If your press has a die closing time of one-half second (.5 second), the calculations would be:

$$D = 63 \times .5 = 31.5$$

The trip devices would need to be at least 31 1/2 inches from the point of operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-45524, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-45526 Provide additional safeguards when the operator puts one or both hands into the point of operation.**

**IMPORTANT:**

This rule applies when the operator puts one or both hands into the point of operation to feed or remove parts, and the point of operation is protected by **any** of the following:

- Presence-sensing device.
- Two-hand control.
- Type B gate or movable barrier device.

**You must:**

- Make sure the press has both a:
  - Stopping-performance monitor (previously called brake-system monitor);

**AND**

– Control system that monitors the performance of safety-related functions (previously called control reliability).

- Make sure the stopping-performance monitor meets the requirements of:

– American National Standards Institute (ANSI) B11.1-1982, Mechanical Power Presses - Safety Requirements for Construction, Care, and Use for presses manufactured **before** January 1, 2005.

– ANSI B11.1-2001, Safety Requirements for Mechanical Power Presses for presses manufactured **on or after** January 1, 2005.

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- Make sure the control system monitors the performance of safety-related functions so that failure of any component in the control system:

- Does not prevent normal stopping action of the press.
- Prevents initiation of another cycle (stroke) until the failure is corrected.
- Can be detected by a simple test or is indicated by the control system.

**Exemption:** This requirement does not apply to control system components that do not affect protection from point-of-operation hazards.

**Definition:**

The control system includes the sensors, manual input and mode selection elements, interlocking and decision-making circuitry, and output elements of the press-operating devices and mechanisms.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45526, filed 6/29/04, effective 1/1/05.]

## OPERATIONS

### **WAC 296-806-45528 Establish die setting procedures.**

**You must:**

- Develop and use procedures to protect employees from the hazards of die setting.
- Make sure die setters are provided with at least the following information:
  - Rated press capacity requirements for the die.
  - Weight of the upper die and other slide attachments required for job setup and setting counterbalance air pressure.
  - Total die weight.

**Note:** This information may be stamped on the die or kept in a file that is readily available to the die setters.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45528, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-45530 Handle dies safely.**

**You must:**

- Make sure dies requiring mechanical handling have handling equipment attachment points.
- Use die stops or other means to prevent losing control of the die while setting or removing dies from presses that are inclined.
  - Make sure the upper and lower shoes will securely mount the die to the bolster and slide.
  - Use additional means of securing the upper shoe to the slide where clamp caps or set screws are used in conjunction with punch stems.
  - Make sure spring-loaded turnover bars are provided for presses designed to accept them.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45530, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-45532 Protect die setters during setup and tryout.**

**You must:**

- (1) Use safety blocks when an employee has to put their hands or other body part into the point of operation to adjust or repair dies.

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- (2) Protect die setters doing die tryout from point-of-operation hazards by **at least one** of the following:

- Properly installed, adjusted, and maintained guards or devices.
- Proper use of INCH mode (part-revolution clutch press).
- Proper use of JOG mode (full-revolution clutch press).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45532, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-45534 Train press operators.**

**You must:**

- (1) Train operators to safely operate the press.
- (2) Make sure modified or reconstructed presses have instructions to establish new or changed guidelines for use and care of the press.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45534, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-45536 Operate mechanical power presses safely.**

**You must:**

- Operate the press within the manufacturer's rated capacities.

**Note:** Rated capacities include, but are not limited to:

- Structural capacity.
- Torque capacity.
- Energy capacity.
- Thermal capacity.
- Attachment weight.
- Die shutheight.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45536, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-45538 Provide tools and other means to protect press operators.**

**You must:**

- Make sure hand tools are provided and used to free and remove workpieces or scrap stuck in the die.
- Provide means for handling scrap from roll feed or random length stock operations.
- Provide and use means to keep operators and die setters from reaching into the point of operation or other hazard area to lubricate material or die components.

**Note:** Means for lubricating include, but are not limited to:

- Brushes.
- Swabs.
- Lubricating rolls.
- Manual spray systems.
- Automatic spray systems.
- Handles on brushes or swabs should be long enough to keep persons using them clear of the point of operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45538, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-45540 Inspect and maintain presses.**

**You must:**

- (1) Make sure maintenance personnel are trained and competent to inspect and maintain power presses.
- (2) Keep records of all maintenance or repair work.
- (3) Inspect and test the following press systems **at least weekly**:
  - Clutch/brake mechanism.
  - Antirepeat feature.

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- Single stroke mechanism.
- Keep records of inspections and tests.

**Exemption:** You do not have to do weekly inspections if your press has both:

- Performance of safety-related functions monitoring (previously called control reliability);

**AND**

- A stopping-performance monitor (previously called brake-system monitor) does not require weekly inspections.

**Reference:** For requirements for these monitoring devices, see Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45540, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-45542 Make sure presses and operating practices used in the PSDI (presence sensing device initiation) mode of operation meet these requirements.**

**You must:**

- Make sure presses and operating practices used in the PSDI mode meet the requirements of 29 CFR 1910.217(h), Presence Sensing Device Initiation (PSDI).

**Note:** 29 CFR 1910.217(h) contains requirements for certification and validation of mechanical power presses used in the PSDI mode of operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-45542, filed 6/29/04, effective 1/1/05.]

## **MILLS**

**WAC 296-806-460 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies only to mills in the rubber and plastics industry that have in-running metal rolls that are set horizontally and run toward each other.

**Your responsibility:**

To protect employees from hazards associated with mills.

**You must:**

Meet height requirements for mill rolls

WAC 296-806-46002.

Provide mill safety controls

WAC 296-806-46004.

Follow these stopping limit requirements for mills

WAC 296-806-46006.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-460, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-46002 Meet height requirements for mill rolls.**

**You must:**

- Make sure that the tops of mill rolls installed after August 27, 1971, are at least fifty inches above the working level where the operator stands.

- This distance applies to the actual working level, which could be:

- The general floor level.

- In a pit.

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- On a platform.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46002, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-46004 Provide mill safety controls.**

**Exemption:** These rules do not apply to mills if the machinery is permanently set up so employees:

- Cannot reach through, over, under, or around to come in contact with the roll bite;

**OR**

- Cannot be caught between a roll and nearby objects.

**You must:**

(1) Provide a safety trip control that is easy to reach, operates readily on contact, and is located in front and back of each mill. Each safety trip control must include at least one of the following:

- Pressure-sensitive body bars that:

- Are installed at the front and back of mills having a forty-six inch roll height or over.

- Operate readily on contact from the pressure of the mill operator's body.

- Safety trip rods that are:

- Installed in the front and back of each mill and located within two inches of the front and rear rolls.

- Installed so the top rods are no more than seventy-two inches above the level where the operator stands.

- Easy to reach and operate when the rods are pushed or pulled.

- Safety tripwire cables or wire center cords that are:

- Installed in the front and back of each mill.

- Located within two inches of the face of the rolls.

- Installed so that cables are no more than seventy-two inches above the level where the operator stands.

- Easy to operate whether pushed or pulled.

(2) Make sure that all auxiliary equipment such as mill dividers, support bars, spray pipes, feed conveyors, and strip knives do not interfere with safety devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46004, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-46006 Follow these stopping limit requirements for mills.**

**You must:**

- Make sure that mills are stopped within one and one-half percent of the fastest speed at which they operate when empty.

- When mills operate at more than two hundred fifty feet per minute, stopping distances above one and one-half percent of their fastest speed are allowed, but must have engineering support.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46006, filed 6/29/04, effective 1/1/05.]

## **PRESS BRAKES**

**WAC 296-806-465 Summary.** If your specific machine or operation is not listed here, then follow any general requirements in this section along with the "Requirements for all machines" in this chapter, WAC 296-806-200 and 296-806-300.

This section applies to all machines classified as power press brakes. Power press brakes use a ram and bed to bend material.

**Your responsibility:**

To protect employees from hazards associated with power press brakes.

**You must:**

**General requirements for press brakes**

Provide auxiliary safety aids

WAC 296-806-46502.

Safeguard the point of operation on press brakes

WAC 296-806-46504.

**Safe distance safeguarding**

Follow this requirement when using safe distance safeguarding

WAC 296-806-46506.

Develop a safe distance safeguarding program

WAC 296-806-46508.

Follow these requirements for safe distance training

WAC 296-806-46510.

Require safe distance retraining

WAC 296-806-46512.

Conduct periodic safe distance inspections

WAC 296-806-46514.

Supervise the safe distance program

WAC 296-806-46516.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-465, filed 6/29/04, effective 1/1/05.]

## GENERAL REQUIREMENTS FOR PRESS BRAKES

### WAC 296-806-46502 Provide auxiliary safety aids on press brakes.

**IMPORTANT:**

This rule applies if the safeguarding method prevents the operator from holding the work piece during the closing of the stroke.

**You must:**

- Provide one of the following auxiliary safety aids that will allow operators to remove their hands from the work during the closing of the stroke:

- Work supporting devices.

- Magnetic material-position gages.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46502, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-46504 Safeguard the point of operation on press brakes.

**You must:**

- Safeguard the point of operation on press brakes by at least one of the following:

- Physical guards.

- Devices.

- One-quarter inch maximum die opening.

- Safe distance safeguarding if **all** of the following apply:

- Physical barriers and devices such as two-hand controls, holdouts, restraints, and presence sensors, are demonstrated to not be feasible.

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- This safeguarding method is only for one-time fabrication, custom made parts, or small quantity runs of no more than four hours per month.

- A safety program is provided that includes safe work procedures, training, and supervision to make sure work is performed using safe distance measures.

- There is no workplace record of injuries from failing to maintain a safe distance.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46504, filed 6/29/04, effective 1/1/05.]

## SAFE DISTANCE SAFEGUARDING

### WAC 296-806-46506 Follow this requirement when using safe distance safeguarding.

**You must:**

- Make sure employees position themselves no closer than necessary and never closer than four inches from the power press brake point of operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46506, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-46508 Develop a safe distance safeguarding program for press brakes.

**You must:**

- Develop, document, and use an effective safe distance safeguarding program.

- Include methods for maintaining the minimum safe distance requirements in, Follow this requirement when using safe distance safeguarding, WAC 296-806-46506.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46508, filed 6/29/04, effective 1/1/05.]

### WAC 296-806-46510 Follow these requirements for safe distance training for press brakes.

**You must:**

(1) Train your employees in the safe distance safeguarding program and include **all** of the following:

- The need for safety awareness between the power press brake operator and, when required, the helper.

- The purpose and function of operating controls, operating mode controls, die space height adjustment positions, and other brake controls.

- The hazards of placing any parts of the body into the point of operation.

- The hazards related to each specific work piece bending operation.

- The purpose and function of hand-feeding tools.

- The dangers of unsafe work practices, inattention, horseplay, and misuse of equipment.

- The importance of reporting unsafe conditions immediately to the supervisor.

(2) Make sure employees are proficient in safe distance safeguarding after training, and follow both:

- Safe-operating instructions and recommendations of power press brake manufacturers;

**AND**

- Industry-recognized safe working practices for power press brakes.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-46510, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-46512 Require safe distance retraining for press brake operations.****You must:**

(1) Require safe distance retraining when employees either:

- Are seen operating the power press brake in an unsafe manner;

**OR**

- Fail to use safe distance procedures.

(2) Require safe distance retraining when conditions in the workplace change that can affect safe operation of the power press brakes, such as introducing new or revised control methods and procedures.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-46512, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-46514 Conduct periodic safe distance inspections on press brakes.****You must:**

(1) Conduct periodic inspections of safe distance procedures at least annually to make sure that established procedures are being followed.

(2) Make sure inspections are performed by a trained person who is **not** the person using the safe distance procedure.

(3) You must identify **all** of the following during safe distance procedure inspections:

- The date of the inspection.
- The person performing the inspection.
- The power press brake for which you are using the procedures.
- Any deviations or inadequacies with procedures and requirements.
- Joint reviews with each trained employee about their responsibilities under the safe distance program.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-46514, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-46516 Supervise the safe distance program for press brakes.****You must:**

- Provide adequate supervision to make sure that:
  - Only trained employees operate power press brakes.
  - Employees use work practices learned in your training program.
    - Periodic safe distance inspections are conducted as outlined in, Conduct periodic safe distance inspections on press brakes, WAC 296-806-46514.
    - Any deviations from, or inadequacies in, program procedures or work practices are promptly corrected.
    - Designated safeguarding means are used, installed, and functioning properly.
    - Recommended hand-feeding tools are used, when needed.
    - To require retraining and other appropriate corrective action when necessary.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-46516, filed 6/29/04, effective 1/1/05.]

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**ROLL-FORMING AND BENDING MACHINES**

**WAC 296-806-470 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to power driven roll-forming and bending machines that change the shape or the direction of materials by using rolls, rotary forming dies, and associated tooling.

**Your responsibility:**

To protect employees from hazards associated with roll-forming and bending machines.

**You must:**

Follow these requirements for machine initiation  
WAC 296-806-47002.

Safeguard nip points on roll-forming and bending machines

WAC 296-806-47004.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-470, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-47002 Follow these requirements for machine initiation.****You must:**

• Make sure all of the following occur before starting machines:

- Select "normal" operation mode.
- Safeguards are in place and functioning.
- No workers are within the hazard zones.
- Other proper work practices are followed.

• Make sure in the "jog mode," the machine function is initiated by the operator either:

- During set-up;

**OR**

- By threading the material through the forming rolls.

• Make sure only assigned test employees perform machine testing and start-up.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-47002, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-47004 Safeguard nip points of roll-forming and bending machines.****You must:**

• Safeguard in-running nip points on roll-forming and bending machines with **at least one** of the following:

- A point-of-operation guard or device.
- An emergency stop device.

■ An emergency stop device must be used when a point-of-operation guard or device is not feasible.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-47004, filed 6/29/04, effective 1/1/05.]

**SANDING MACHINES**

**WAC 296-806-475 Summary.** In addition to the requirements in this section, you need to refer to the follow-

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ing sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to sanding machines that remove material from stock with an abrasive sanding surface such as a belt, disk, or drum.

**Exemption:** This section does not apply to hand-held sanders. See, Portable power tools, chapter 296-807 WAC, for requirements that apply to hand-held tools.

**Reference:**

- If you have multiple specific machines and operations in your workplace, you need to follow all requirements in WAC 296-806-400 that apply.
  - For example, if you use sanding machines and saws and cutting heads, you need to refer to both of these sections.
  - In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:
    - WAC 296-806-200, Requirements for all machines.
    - WAC 296-806-300, Requirements for machine parts.
  - See chapter 296-807 WAC, Portable power tools, for requirements that apply to hand-held sanders.

#### **Your responsibility:**

**To protect employees from hazards associated with drum, disk, and belt sanders.**

#### **You must:**

- Guard drum sanders  
WAC 296-806-47502.
- Guard disk sanders  
WAC 296-806-47504.
- Guard belt sanders  
WAC 296-806-47506.
- Follow these requirements for feed roll guarding  
WAC 296-806-47508.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-475, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-47502 Guard drum sanders.**

#### **You must:**

- Make sure drum sanders have one of the following to enclose that part of the drum not used to work on the material:
  - Guard.
  - Exhaust hood.

**Reference:** Exhaust hoods are required on sanders when dust levels exceed exposure limits. For requirements about air contaminants, see Respiratory hazards, chapter 296-841 WAC.

**Exemption:** When a table is used for the application of material to be finished, you do not need to enclose the portion of the drum above the table that is necessary to do the work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-47502, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-47504 Guard disk sanders.**

#### **You must:**

- Make sure disk sanders have an exhaust hood, when required, or a guard that encloses the part of the disk not used to work on the material.

**Exemption:** When a table is used for the application of material to be finished, you do not need to enclose the portion of the disk above the table that is necessary to do the work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-47504, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-47506 Guard belt sanders.**

#### **You must:**

- Protect the operator by guarding:
  - Nip points where the sanding belt runs on the pulleys.
  - The unused run of the sanding belt.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-47506, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-47508 Follow these requirements for feed roll guarding.**

#### **You must:**

- Make sure that feed rolls have a hood or guard to prevent the operator's hands from coming in contact with the in-running rolls at any point.
  - Make sure that the guard meets ALL of the following:
    - Is constructed of heavy material, preferably metal.
    - The bottom of the guard comes down to within three-eighths inch of the plane formed by the bottom or working surfaces of the feed rolls.

■ When the three-eighths inch distance is increased to three-quarter inch, the lead edge of the hood must be extended to five and one-half inches or more in front of the nip point between the front roll and the work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-47508, filed 6/29/04, effective 1/1/05.]

### **SAWS AND CUTTING HEADS**

**WAC 296-806-480 Summary.** If your specific machine or operation is not listed here, then be sure to follow any of the following requirements that apply:

- General requirements for all saws and cutting heads in this section.
- General requirements for all saws in this section.
- General requirements for all cutting heads in this section.
- "Requirements for all machines" found in this chapter, WAC 296-806-200 and 296-806-300.

**Reference:** For requirements on hand-held tools, see Portable power tools, chapter 296-807 WAC.

This section applies to fixed machines using saws or cutting heads that are used on any material.

#### **Your responsibility:**

To make sure machines using saws and cutting heads meet these requirements.

#### **You must:**

#### **GENERAL REQUIREMENTS FOR ALL SAWS AND CUTTING HEADS**

Protect employees using saws and cutting heads

WAC 296-806-48002.

Make sure saws and cutting heads are sharpened and tensioned by qualified people

WAC 296-806-48004.

#### **SAWS**

#### **General Requirements for All Saws**

Make sure saws are safe to use

WAC 296-806-48006.

**Requirements for All Circular Saws**

Make sure all circular saws meet these requirements

WAC 296-806-48008.

Make sure circular saw gages meet these requirements

WAC 296-806-48010.

Guard hand-fed circular table saws

WAC 296-806-48012.

Provide kickback protection for employees using hand-fed circular table rip-saws when ripping wood

WAC 296-806-48014.

Safeguard self-feed circular saws

WAC 296-806-48016.

Provide kickback protection for self-feed circular rip-saws when ripping wood

WAC 296-806-48018.

Guard circular resaws

WAC 296-806-48020.

Provide spreaders for circular resaws

WAC 296-806-48022.

**Requirements for Specific Circular Saws**

Protect employees from automatic saw hazards

WAC 296-806-48024.

Guard inverted swing (jump) saws

WAC 296-806-48026.

Guard miter saws

WAC 296-806-48028.

Guard radial saws

WAC 296-806-48030.

Limit the travel of radial saws

WAC 296-806-48032.

Provide kickback protection for radial saws used for ripping wood

WAC 296-806-48034.

Guard revolving double arbor saws

WAC 296-806-48036.

Guard swing saws

WAC 296-806-48038.

Limit the travel of swing saws

WAC 296-806-48040.

**Requirements for Band Saws and Drag Saws**

Make sure bandsaws meet these requirements

WAC 296-806-48042.

Protect employees from drag saw hazards

WAC 296-806-48044.

**CUTTING HEADS****General Requirements for All Cutting Heads**

Maintain and balance knives and cutting heads

WAC 296-806-48046.

**BORING AND MORTISING MACHINES**

Make sure boring and mortising machines meet these requirements

WAC 296-806-48048.

**CHIPPER AND HOG MILLS**

Follow these requirements for chipper mills

WAC 296-806-48050.

Follow these requirements for hog mills

WAC 296-806-48052.

Protect employees from falling into chipper and hog mills

WAC 296-806-48054.

**JOINTERS**

Make sure jointers with horizontal cutting heads meet these requirements

WAC 296-806-48056.

Guard horizontal cutting heads on hand-fed jointers

WAC 296-806-48058.

Guard vertical cutting heads on jointers

WAC 296-806-48060.

**MOLDING, STICKING AND MATCHING MACHINES**

Make sure molding, sticking and matching machines meet these requirements

WAC 296-806-48062.

**PANEL RAISERS AND OTHER SIMILAR MACHINES**

Guard hand-fed panel raisers and other similar machines

WAC 296-806-48064.

**PLANERS**

Make sure planers with a horizontal cutting head meet these requirements

WAC 296-806-48066.

Guard planers

WAC 296-806-48068.

Guard planer feed rolls

WAC 296-806-48070.

Provide kickback protection on planers running stock of varied thicknesses

WAC 296-806-48072.

**SHAPERS**

Make sure shapers meet these requirements

WAC 296-806-48074.

**TENONING MACHINES**

Guard tenoning machines feed chains and sprockets

WAC 296-806-48076.

Guard tenoning machines

WAC 296-806-48078.

**VENEER MACHINERY**

Guard veneer cutters and wringer knives

WAC 296-806-48080.

Guard veneer clippers

WAC 296-806-48082.

Follow these requirements for guarding guillotine cutters

WAC 296-806-48084.

Provide mechanisms to stop power-driven guillotine cutters

WAC 296-806-48086.

Prohibit riders on veneer slicer carriages

WAC 296-806-48088.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-480, filed 6/29/04, effective 1/1/05.]

**GENERAL REQUIREMENTS FOR ALL SAWS AND CUTTING HEADS**

**WAC 296-806-48002 Protect employees using saws and cutting heads.**

**You must:**

- Provide safeguarding to protect employees from the hazards of feed rolls.
- Provide types and sizes of push sticks or push blocks that are suitable for the work being done.
- Use a comb (featherboard) or a suitable jig to protect employees when a standard guard cannot be used.

**Note:** Operations where you may need a comb or jig include:

- Dadoing.
- Grooving.
- Jointing.
- Moulding.
- Rabbeting.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48002, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48004 Make sure saws and cutting heads are sharpened and tensioned by qualified people.**

**You must:**

- Make sure people who sharpen or tension saw blades or cutters have demonstrated skill in this area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48004, filed 6/29/04, effective 1/1/05.]

**SAWS**

**General Requirements for All Saws**

**WAC 296-806-48006 Make sure saws are safe to use.**

**You must:**

- Immediately remove from service a saw that has **any of the following** problems:

- Cracked.
- Dull.
- Badly set.
- Improperly filed.
- Improperly tensioned.

- Immediately clean any saw where gum has begun to stick on the sides.

- Eliminate unintended fence and table movement during operation.

- Keep hinged tables and fences firmly secured and in true alignment for all positions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48006, filed 6/29/04, effective 1/1/05.]

**Requirements for All Circular Saws**

**WAC 296-806-48008 Make sure all circular saws meet these requirements.**

**You must:**

- Protect employees from contacting the portion of the saw beneath or behind the table by covering it with either:

- An exhaust hood, if one is required;

**OR**

- A guard.

- Prohibit workers from inserting wedges between the saw disk and the collar to form a wobble saw.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48008, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48010 Make sure circular saw gages meet these requirements.**

**You must:**

- Make sure circular saw gages slide in grooves or tracks that are accurately machined to maintain exact alignment with the saw for all positions of the guide.

**Note:** Circular saw gages are also referred to as miter or positioning gages.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48010, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48012 Safeguard hand-fed circular table saws.**

**You must:**

- Guard each hand-fed circular saw with a hood that completely encloses both the portion of the saw that is above both:

- The table;

**AND**

- The material being cut.

- Make sure the hood is designed and constructed to do **all** of the following:

- Protect the operator from flying splinters and broken saw teeth.

- Strong enough to resist damage from reasonable operation, adjustments, and handling.

- Made of material soft enough to not break saw teeth.

**Note:** Hoods should be made of material that:

- Does not shatter when broken.
- Is not explosive.
- Is less combustible than wood.

**You must:**

- Mount the hood so it does **all** of the following:

- Operates positively and reliably.

- Maintains true alignment with the saw.

- Resists any side thrust or force that could throw it out of line.

- Make sure the hood:

- Allows the material to be inserted or sawed without any considerable resistance;

**AND**

- Does one of the following:

- Automatically remains in contact with the material being cut;

**OR**

- Is manually adjusted to within one-quarter inch of the material being cut.

**Exemption:** Saws may be guarded with a fixed enclosure, fixed barrier guard, or a manually adjusted guard when specific conditions prevent using a standard automatic adjusting guard. Alternative guards have to both:

- Provide protection equivalent to a standard automatic adjusting guard;

**AND**

- Be used according to the manufacturer's instructions with sufficient supervision to comply with this requirement.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48012, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48014 Provide kickback protection for employees using hand-fed circular table rip saws when ripping wood products.**

**Definition:**

*Ripping* is a sawing operation made:

- Through the thickness of the work piece with the grain of natural wood;

- Along the long dimension of a rectangular work piece;

**AND**

- Usually parallel to that edge on reconstituted wood products.

[Title 296 WAC—p. 2797]

This can also be described as cutting stock to width. Two or more pieces result from the operation.

**You must:**

- Provide a spreader or riving knife that is:
  - Made of hard-tempered steel or its equivalent.
  - Thinner than the saw kerf.
  - Wide enough to provide sufficient stiffness and rigidity to resist any reasonable side thrust or blow that could bend or throw it out of position.
    - Attached so it remains in true alignment with the saw when the saw or table is tilted.

**Note:** • The spreader or riving knife should:
 

- Prevent material from either squeezing the saw or being thrown back at the operator.
- Be placed so there is one-half inch or less space between it and the back of the saw when the largest saw is mounted in the machine.

**Exemption:** You do not have to provide a spreader or riving knife when grooving, dadoing, or rabbeting. When you finish these operations, replace the spreader immediately.

**You must:**

- Provide nonkickback fingers or dogs that are:
  - Located so they prevent the saw from either picking up the material or throwing the material back towards the operator.
  - Designed to hold any thickness of material being cut.

**Note:** Kickbacks occur when a saw seizes the stock and hurls it back at the operator. This can happen when the stock twists and binds against the side of the blades or is caught in the teeth. Kickbacks occur more often when cutting parallel to the wood grain (ripping) than when cross cutting. Common contributors to kickbacks include:
 

- A blade that is not sharpened.
- A blade set at an incorrect height.
- Poor quality lumber, such as frozen lumber, lumber with many knots, or foreign objects, such as nails.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48014, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48016 Safeguard self-feed circular saws.**

**You must:**

- Provide saws and feed rolls with a hood or guard to protect the operator from contacting the in-running rolls.
  - Make sure the guard is constructed of heavy material, preferably metal.
  - Make sure the distance between the bottom of the guard and the plane formed by the bottom or working surface of the feed rolls meets the requirements of Table 200-1, Largest Allowable Guard Opening, in WAC 296-806-20042.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48016, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48018 Provide kickback protection for self-feed circular ripsaws when ripping wood products.**

**You must:**

- Provide saws with sectional nonkickback fingers that meet **all** of the following requirements:
  - They cover the full width of the feed roll.
  - They are located in front of the saw.
  - They are arranged so they keep continuous contact with the material being fed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48018, filed 6/29/04, effective 1/1/05.]

[Title 296 WAC—p. 2798]

**WAC 296-806-48020 Guard circular resaws.**

**You must:**

- Provide each circular resaw with a metal hood or shield that is:
  - Located above the saw.
  - Designed to protect the operator from flying splinters or broken saw teeth.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48020, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48022 Provide spreaders for circular resaws.**

**Exemption:** This requirement does not apply to self-feed saws with a roller or wheel at the back of the saw.

**You must:**

- Provide a spreader that is **all** of the following:
  - Securely fastened behind the saw.
  - Slightly thinner than the saw kerf.
  - Slightly thicker than the saw disk.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48022, filed 6/29/04, effective 1/1/05.]

**Requirements for Specific Circular Saws**

**WAC 296-806-48024 Protect employees from automatic saw hazards.**

**You must:**

- Make sure automatic saws that stroke continuously without the operator controlling each stroke are **not** used where employees could be exposed to:
  - Saw hazards during operations such as loading, clamping, cutting, or unloading.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48024, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48026 Guard inverted swing (jump) saws.**

**You must:**

- (1) Guard jump saws with a hood that both:
  - Covers the part of the saw that is exposed above the top of the table or above the material being cut;
- AND**
- Automatically adjusts to the thickness of the material being cut and remains in contact with it.
- (2) Provide a holding device that will prevent stock from moving while cutting materials.
- (3) Provide warning signs, stickers, or placards when the pinching hazard created by the holding device cannot be eliminated by design.
- (4) Provide the following for automatically fed jump saws.

- Place guards over the roller conveyor to prevent persons from walking into or over the saw.
- Enclose jump saws when below the table or roller conveyor and not in actual use.
  - Install a positive stop to prevent the saw from passing the front edge of the roller conveyor or table.
  - Make sure the throat in the table or roller conveyor is only wide enough to permit unobstructed operation of the saw.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48026, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48028 Guard miter saws.**

**IMPORTANT:**

Miter saws include:

- Miter.
- Compound miter.
- Slide miter.
- Compound slide miter.

**You must:**

(1) Guard miter saws with an upper hood that completely encloses the upper half of the blade.

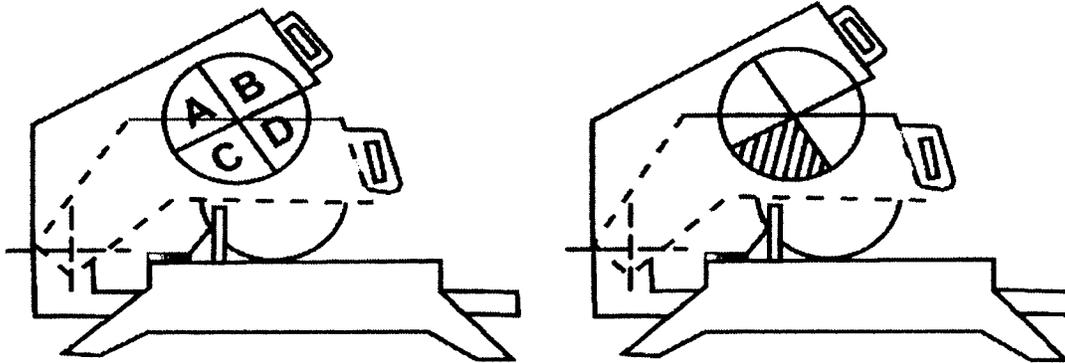
(2) Provide a method to protect employees from contacting the blade underneath the table while in its recommended carrying position.

(3) Guard the lower blade:

- By making sure the teeth are guarded at least three-quarters of an inch beyond the root of the teeth, toward the center of the blade, except for a maximum forty-five degree exposure of quadrant C when in the full retract position. See Illustration 480-1, Miter Saw Guarding.

- With a retractable guard that cannot be locked in any position.

**Illustration 480-1  
Miter Saw Guarding**



This illustration shows miter saws in full retract position, and quadrant C, where 45 degrees, or half of quadrant C may be exposed when in the full retract position.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48028, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48030 Guard radial saws.**

**You must:**

• Make sure the radial saw has a hood that does **all** of the following:

– Completely encloses the upper portion of the blade down to a point that includes the end of the saw arbor.

– Protects the operator from flying splinters and broken saw teeth.

– Deflects sawdust away from the operator.

• Provide a lower blade guard that does **all** of the following (see Guard radial saws, illustration 480-2):

– Guards the sides of the lower exposed portion of the blade to its full diameter.

– Automatically adjusts to the thickness of the stock being cut.

– Remains in contact with the stock to provide the maximum protection possible for the operation being performed;

**OR**

– Is manually adjusted (wing) guard that:

- Is made of material strong enough to withstand the forces put on it.

- Suggested materials include polycarbonates or expanded metal.

- Has edges that are smooth so no hazards from the guard exist.

(2007 Ed.)

- Extends a minimum of eight inches to both the front and arbor-end sides.

- Is adjustable in a vertical plane to the different thicknesses of stock so the gap is three-eighths inch or less between the bottom of the guard and the top of the stock.

**Exemption:** Saws may be guarded with a fixed enclosure, fixed barrier guard, or a manually adjusted guard when specific conditions prevent using a standard, automatic adjusting guard. Alternative guards have to both:

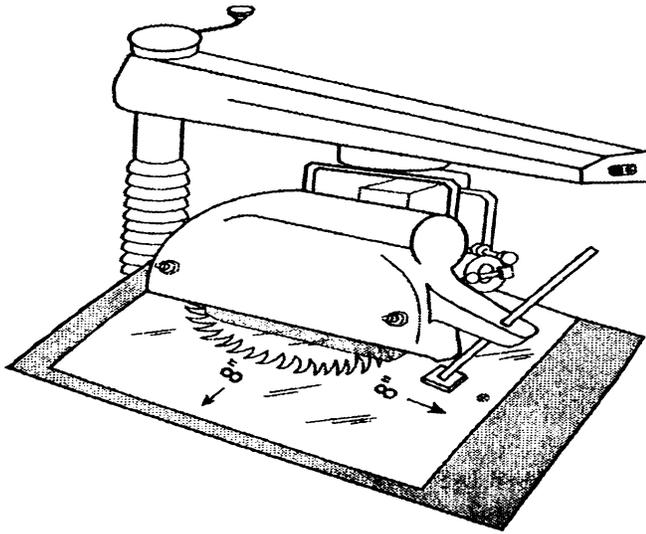
- Provide protection equivalent to a standard automatic adjusting guard;

**AND**

- Be used according to the manufacturer's instructions with sufficient supervision to meet this requirement.

**Illustration 480-2 Guard radial saws**

A manually adjusted awareness barrier guard that extends 8 inches to the front and sides of the blade



[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48030, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48032 Limit the travel of radial saws.****You must:**

- Provide an adjustable stop that prevents:
  - Forward travel of the blade beyond the position necessary to complete the cut;

**AND**

- Any part of the saw blade from extending beyond the front edge of the work support table.
- Install the saw so that the front end is slightly higher than the rear in order to cause the cutting head to return to the starting position when released by the operator.
- Make sure the cutting head or carriage does **all** of the following:
  - Returns gently to the rest or starting position when released by the operator.
  - Does not bounce or recoil when reaching the rest or starting position.
  - Remains in the rest or starting position.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48032, filed 6/29/04, effective 1/1/05.]

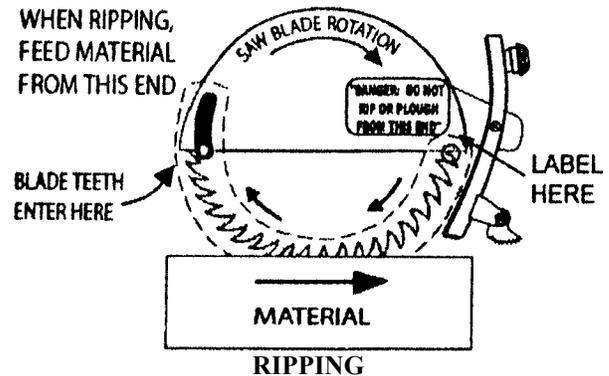
**WAC 296-806-48034 Provide kickback protection for radial saws used for ripping wood products.****You must:**

- Provide nonkickback fingers or dogs that are both:
  - Located on both sides of the saw to resist the tendency of the saw to pick up material or throw it back toward the operator;
- AND**
- Designed to hold any thickness of material being cut.
- Make sure when ripping or ploughing that you feed the material from the end where the blade teeth enter the upper guard, which is against the direction in which the saw turns. See, Ripping with a radial arm saw, illustration 480-3.
- Make sure the direction of saw rotation is clearly marked on the hood.

[Title 296 WAC—p. 2800]

- Fasten a permanent label at the rear of the guard hood, at about the level of the arbor, where the blade teeth exit the upper hood during saw operation that:

- Reads, "DANGER: DO NOT RIP OR PLOUGH FROM THIS END."
- Is colored standard danger red.
- Is not less than one and one-half inches by three-quarters inch with standard proportional lettering.

**RIPPING WITH A RADIAL ARM SAW****Illustration 480-3**

Important requirements for ripping with a radial arm saw.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48034, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48036 Guard revolving double arbor saws.****You must:**

- Guard each revolving double arbor saw with a hood that completely encloses the portion of the saw that is above both:

- The table;

**AND**

- The material being cut.

- Note:** Hoods should be made of material that:
- Does not shatter when broken.
  - Is not explosive.
  - Is less combustible than wood.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48036, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48038 Guard swing saws.****IMPORTANT:**

This section applies to swing saws mounted above the table.

**You must:**

- Provide saws with a hood that encloses **all** of the following:
  - Upper half of the saw.
  - Arbor end.
  - Point of operation in all positions of the saw.
- Make sure the hood protects operators from flying splinters and broken saw teeth.
- Make sure the lower blade guard will automatically cover the lower portion of the blade by dropping on top of and remaining in contact with the table or the material being cut.

(2007 Ed.)

- Exemption:** Saws may be guarded with a fixed enclosure, fixed barrier guard, or a manually adjusted guard when specific conditions prevent using a standard, automatic adjusting guard. Alternative guards have to:
- Provide protection equivalent to a standard automatic adjusting guard;
  - AND**
  - Be used according to the manufacturer's instructions with sufficient supervision to meet this requirement.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48038, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-48040 Limit the travel of swing saws.**

#### **IMPORTANT:**

This section applies to swing saws that are mounted above the table.

#### **You must:**

- Provide saws with a device that:
  - Automatically returns the saw to the back of the table when the saw is released at any point in its travel.
  - Does not depend on a rope, cord, or spring to function properly.
- Make sure devices that use a counterweight meets these requirements:
  - The bolts supporting the bar and the counterweight use cotter pins.
  - The counterweight is prevented from dropping by **one** of these methods:

- A bolt passing through both the bar and the counterweight.
- A bolt through the extreme end of the bar.
- A safety chain to hold it to the bar if the counterweight does not completely encircle the bar.

- Provide limit chains or another equally effective device to prevent the saw from swinging either:
  - Beyond the front or back edge of the table;

#### **OR**

- Forward to a position where the gullets of the lowest saw teeth will rise above the table top.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48040, filed 6/29/04, effective 1/1/05.]

### **Requirements for Band Saws and Drag Saws**

**WAC 296-806-48042 Make sure band saws meet these requirements.**

#### **You must:**

- Enclose or guard all portions of the blade except for the working portion of the blade between the guide rolls and the table.
- Make sure the guard for the portion of the blade between the sliding guide and the wheel guard meets these requirements:
  - Protects the front and outer side of the blade.
  - Is self-adjusting to move with the guide.
  - Adjusts so the gap between the guide rolls and stock is as small as is practical.
- Fully enclose band saw wheels with wheel guards that meet **both** of the following requirements:
  - The outside periphery of the wheel enclosure is solid;
  - AND**
  - The front and back of the wheels are enclosed by solid material, wire mesh, or perforated metal.

(2007 Ed.)

- Make sure the material used for wheel guards meets these requirements:

- Wire mesh and perforated metal guards:
  - Are at least 0.037 inch (U.S. Gage No. 20) thick.
  - Have openings in them that are three-eighths inch or less.
- Solid material has strength and firmness equivalent to a wire mesh or perforated steel guard.

- Make sure band saws have a tension control device to indicate the proper tension for standard saws used on the machine.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48042, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48044 Protect employees from drag saw hazards.**

#### **You must:**

- Protect employees passing near a drag saw by either:
  - Providing a four-foot clearance when the saw is at the extreme end of the stroke;

#### **OR**

- Enclosing the saw and its driving mechanism, if you cannot provide a four-foot clearance.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48044, filed 6/29/04, effective 1/1/05.]

## **CUTTING HEADS**

### **General Requirements for All Cutting Heads**

**WAC 296-806-48046 Maintain and balance knives and cutting heads.**

#### **You must:**

- Make sure knives and cutting heads are kept:
  - Sharp.
  - Properly adjusted.
  - Firmly secured.
- Make sure knives are properly balanced when two or more are used in one cutting head.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48046, filed 6/29/04, effective 1/1/05.]

## **BORING AND MORTISING MACHINES**

**WAC 296-806-48048 Make sure boring and mortising machines meet these requirements.**

- Exemption:** This section does not apply to drill presses, boring machines, or mortising machines if both of the following apply:

- The downward stroke of the chuck and bit is controlled manually by the operator;

#### **AND**

- The chuck and bit automatically rises to the start position when control is released.

#### **You must:**

- Completely enclose universal joints on spindles of boring machines to prevent accidental contact by the operator.
- Make sure you do not use safety bit chucks that have projecting set screws.
- Enclose the top of the cutting chain and driving mechanism.
- Prevent a counterweight, when used, from dropping by one of the following, or an equivalent method:

[Title 296 WAC—p. 2801]

– Securing it to a bar by one of the following:

■ A bolt passing through both the bar and the counterweight.

■ A bolt through the extreme end of the bar.

■ A safety chain to hold it to the bar if the counterweight does not completely encircle the bar;

OR

– Suspending it by a chain or wire rope and having it travel in a pipe or other suitable enclosure if it could fall and injure an employee.

**Note:** Boring bits should be provided with a guard that will enclose all portions of the bit and chuck above the material being worked.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48048, filed 6/29/04, effective 1/1/05.]

### CHIPPER AND HOG MILLS

**WAC 296-806-48050 Follow these requirements for chipper mills.**

**Exemption:** This section does not apply to mobile chippers.  
**Reference:** Safety requirements for mobile chippers can be found in, Pruning, Repairing, Maintaining and Removing Trees and Cutting Brush, section 9.6, ANSI Z133.1-2000.

**You must:**

(1) Arrange the feed system so the operator does not stand in direct line with the chipper blades or spout (hopper).

(2) Protect the operator from chips or chunks being thrown out while feeding the machine.

(3) Enclose the chipper spout to a height or distance of at least forty inches from the floor or the operator's station, whichever is higher.

(4) Provide a mirror or other device to allow monitoring of material when the operator cannot readily observe the material being fed into the chipper.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48050, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48052 Follow these requirements for hog mills.**

**You must:**

(1) Make sure that feed chutes are at least forty inches from the knives or feed roll.

(2) Provide baffles or other suitable safeguards to prevent material from being thrown from the hog mill.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48052, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48054 Protect employees from falling into chipper and hog mills.**

**You must:**

• Protect employees working near the feed openings of chipper and hog mills from falling into the openings by providing **at least one** of the following:

– A safety belt (or harness) and a lifeline short enough to prevent workers from falling into the mill.

– Barriers or other types of protective guarding.

**Reference:** See, Railing, toeboards and cover specifications for requirements on guardrails used as barriers, WAC 296-24-75011.

[Title 296 WAC—p. 2802]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48054, filed 6/29/04, effective 1/1/05.]

### JOINTERS

**WAC 296-806-48056 Make sure jointers with horizontal cutting heads meet these requirements.**

**You must:**

• Make sure the cutting head on hand-fed jointers is cylindrical:

– Install and adjust the knife blade so it does not protrude more than one-eighth inch beyond the body of the head.

• Make sure the opening in the table meets **all** of the following:

– Is kept as small as possible.

– The clearance between the edge of the rear table and the cutting head is not more than one-eighth inch.

– The table throat opening is not more than two and one-half inches when the tables are set or aligned with each other for zero cut.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48056, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48058 Guard horizontal cutting heads on hand-fed jointers.**

**You must:**

• Provide jointers with an automatic guard on the working side of the fence or gage that does **all** of the following:

– Covers all sections of the head.

– Effectively keeps the operator's hand from contacting the revolving knives.

– Automatically adjusts to cover the unused portion of the head.

– Remains in contact with the material at all times.

• Provide jointers with a guard that covers the section of the head behind the gage or fence.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48058, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48060 Guard vertical cutting heads on jointers.**

**You must:**

• Provide each jointer that has a vertical cutting head with an exhaust hood or other type of guard that completely encloses the revolving head except for a slot that is wide enough for the material being jointed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48060, filed 6/29/04, effective 1/1/05.]

### MOLDING, STICKING AND MATCHING MACHINES

**WAC 296-806-48062 Make sure molding, sticking and matching machines meet these requirements.**

**You must:**

• Make sure all cutting heads, and saws if used, are covered by a guard that:

– Is metal.

– Forms all or part of the exhaust hood if an exhaust system is used.

• Make sure a guard constructed from:

(2007 Ed.)

- Sheet metal is at least one-sixteenth inch thick.
- Cast iron is at least three-sixteenths inch thick.
- Make sure feed rolls are guarded by a hood or other suitable guard that both:
  - Prevents the operator's hand from contacting the in-running rolls at any point;

**AND**

- Is attached to the frame carrying the rolls so it adjusts for any thickness of stock.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48062, filed 6/29/04, effective 1/1/05.]

### PANEL RAISERS AND OTHER SIMILAR MACHINES

#### **WAC 296-806-48064 Guard hand-fed panel raisers and other similar machines.**

**You must:**

- Guard the cutting heads of hand-fed panel raisers and other similar machines by enclosing the cutting head with either:

- A fixed guard such as a cage;

**OR**

- An adjustable guard designed to keep the operator's hand away from the cutting edge.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48064, filed 6/29/04, effective 1/1/05.]

### PLANERS

#### **WAC 296-806-48066 Make sure planers with a horizontal cutting head meet these requirements.**

**You must:**

- Make sure the cutting head on hand-fed planers is cylindrical.
  - Install and adjust the knife blade so it does not extend more than one-eighth inch beyond the body of the head.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48066, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-48068 Guard planers.**

**You must:**

- Make sure all cutting heads, and saws if used, are covered by a guard that:
  - Is metal.
  - Forms all or part of the exhaust hood if an exhaust system is used.
- Make sure a guard constructed from:
  - Sheet metal is at least one-sixteenth inch thick.
  - Cast iron is at least three-sixteenths inch thick.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48068, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-48070 Guard planer feed rolls.**

**You must:**

- Make sure feed rolls are guarded by a hood or other suitable guard that:
  - Prevents the operator's hand from contacting the in-running rolls at any point.
  - Is attached to the frame carrying the rolls so it remains in adjustment for any thickness of stock.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48070, filed 6/29/04, effective 1/1/05.]

#### **WAC 296-806-48072 Provide kickback protection on planers running stock of varied thicknesses.**

**You must:**

- Provide kickback protection on planers running stock of varied thicknesses at the same time by providing either:
  - Sectional feed rolls that provide feeding contact pressure on the stock;

**OR**

- Suitable nonkickback fingers at the infeed end of each section.

**Note:** The sectional feed rolls need to have sufficient yield in their construction to provide contact pressure on:  
– Any thickness of stock the machine is capable of processing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48072, filed 6/29/04, effective 1/1/05.]

### SHAPERS

#### **WAC 296-806-48074 Make sure shapers meet these requirements.**

**You must:**

- Guard the cutting head of the shaper by enclosing it with either:

- A fixed guard, such as a cage;

**OR**

- An adjustable guard designed to keep the operator's hand away from the cutting edge.

- Make sure the diameter of a circular shaper guard is at least as large as the greatest diameter of the cutter.

**Note:** A warning device of leather or other material attached to the spindle is **NOT** an acceptable substitute for a guard.

**You must:**

- Guard all sections of the cutting tool except for an opening to allow access to the work piece by the cutting tool.

**Note:** A ring guard is one means of satisfying the guarding requirement for cutting tools when involved in free hand or template shaping.

**You must:**

- Make sure all double-spindle shapers have a spindle starting and stopping device for each spindle.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48074, filed 6/29/04, effective 1/1/05.]

### TENONING MACHINES

#### **WAC 296-806-48076 Guard tenoning machine feed chains and sprockets.**

**You must:**

- Guard feed chains and sprockets of all double-end tenoning machines by completely enclosing both of the following:
  - All sprockets;

**AND**

- Portions of the chain that are not used for conveying stock.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-14-028, § 296-806-48076, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48078 Guard tenoning machines.****You must:**

- Make sure all cutting heads, and saws if used, are covered by a metal guard that:
  - Covers at least the unused part of the periphery of the cutting head.
  - Forms all or part of the exhaust hood if an exhaust system is used.
- Make sure a guard constructed from:
  - Sheet metal is at least one-sixteenth inch thick.
  - Cast iron is at least three-sixteenths inch thick.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48078, filed 6/29/04, effective 1/1/05.]

**VENEER MACHINES****WAC 296-806-48080 Guard veneer cutters and wringer knives.****You must:**

- Provide guards to prevent accidental contact with the front or rear knife edge.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48080, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48082 Guard veneer clippers.****You must:**

- Make sure employees do not accidentally contact the knife edge of veneer clippers by providing either:
  - An automatic feed;
- OR**
- Guarding at both the front and rear of the clippers.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48082, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48084 Follow these requirements for guarding guillotine cutters.**

**Exemption:** These requirements do not apply to continuous-feed trimmers.

**You must:**

- (1) Provide **one** of the following to hand and foot powered guillotine cutters, so employees' hands cannot reach the cutting edge of the knife:
  - Rods.
  - Plates.
  - Other satisfactory means of protection such as those outlined in, Safeguarding methods, WAC 296-806-20042 through 296-806-20058.
- (2) Provide power-driven guillotine veneer cutters with either of the following:
  - Starting devices for each operator that require all of the following:
    - Both hands activating controls at the same time to start the cutting motion;
    - At least one hand on a control during the complete stroke of the knife;
  - OR**
  - An automatic guard that does all of the following:
    - Keeps the hands of the operator away from the danger zone every time the blade comes down.

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- Is used in combination with one-handed starting devices that require two separate movements of the device to start the cutting motion.
- Is designed to return positively to the nonstarting position after each complete cycle of the knife.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48084, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48086 Provide mechanisms to stop power-driven guillotine cutters.**

**Exemption:** This requirement does not apply to continuous-feed trimmers.

**You must:**

- Provide power-driven guillotine cutters with both:
  - Brakes or other stopping mechanism;

**AND**

- An emergency device that will prevent the machine from operating if the brake fails when the starting mechanism is in the nonstarting position.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48086, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48088 Prohibit riders on veneer slicer carriages.****You must:**

- Prohibit employees from riding on veneer slicer carriages.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48088, filed 6/29/04, effective 1/1/05.]

**SEWING MACHINES**

**WAC 296-806-485 Summary.** In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:

- Requirements for all machines, WAC 296-806-200 and 296-806-300.

This section applies to the hazards of needle injuries from domestic or light duty sewing machines.

**Your responsibility:**

To protect employees from hazards associated with sewing machines.

**You must:**

Guard sewing machine needles  
WAC 296-806-48502.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-485, filed 6/29/04, effective 1/1/05.]

**WAC 296-806-48502 Guard sewing machine needles.**

**Exemption:** This section does not apply to domestic-type sewing machines having a presser-foot that is in the "down" position during operation of the machine.

**You must:**

- Provide a permanently attached guard on each sewing machine that:
  - Prevents the operator's fingers from passing under the needle.
  - Allows the needle to be conveniently threaded without removing the guard.

(2007 Ed.)

**Reference:** For specific requirements about safeguarding sewing machine belts can be found in, Safeguard belt and rope drives, WAC 296-806-30004.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-48502, filed 6/29/04, effective 1/1/05.]

### **WAC 296-806-500 Definitions.**

#### **Abrasive wheel**

A grinding tool consisting of bonded abrasive grains. This includes diamond and reinforced wheels.

#### **Adjustable barrier guard**

A barrier guard with provisions for adjustment to accommodate various jobs or tooling set-ups.

#### **Air-lift hammer**

A type of gravity drop hammer in which the ram is raised for each stroke by an air cylinder. Because the length of stroke can be controlled, ram velocity, and therefore the energy delivered to the work piece, can be varied.

#### **Antirepeat**

A device that limits the machine to a single stroke if the activating means is held in the operative position.

#### **Arbor**

A rotating shaft used for mounting and transmitting torque to a cutting tool.

#### **Authorized person**

Someone the employer has given the authority and responsibility to perform a specific assignment.

#### **Awareness barrier**

A barrier device that allows more access to the hazard area, but still restricts access enough to warn of an approaching hazard.

#### **Barricade**

A barrier such as a guardrail, fence, or other framework designed to prevent employee access and exposure to a hazard.

#### **Barrier guard**

A barrier that provides a physical restriction from a hazard.

#### **Belt conveyors**

An endless belt of any material, operating over suitable pulleys to move materials placed on the belt.

#### **Belt pole**

A device used in shifting belts on and off fixed pulleys on line or countershaft where there are no loose pulleys. Belt poles are sometimes called "belt shippers" or "shipper poles."

#### **Belt shifter**

A device for mechanically shifting belts from tight to loose idler pulleys or vice versa, or for shifting belts on cones of speed pulleys.

#### **Bench grinder**

A bench mounted off-hand grinding machine with either one or two wheels mounted on a horizontal spindle.

#### **Bending**

The application of stress concentrated at specific points to permanently turn, press or force from a straight, level or flat condition to a curved or angular configuration.

#### **Blade**

A replaceable tool having one or more cutting edges for shearing, notching or coping.

#### **Blanking**

To bypass a portion of the sensing field of a presence-sensing device. The purpose is to allow objects such as tooling, feed stock, and work pieces to pass through the sensing field without sending a stop signal to the controlled machine. There are two blanking modes: Fixed and floating.

#### **Blind hole**

A hole drilled in an object, such as an abrasive wheel, that does not go all the way through the object.

#### **Blotter**

A compressible disc or washer, usually of blotting paper, plastic, cardboard, or gasket material, that is used between the wheel and the flanges to evenly distribute flange pressure on the wheel.

#### **Board hammer**

A type of gravity drop hammer where wood boards attached to the ram are raised vertically by action of contrarotating rolls, and then released. Energy for forging is obtained by the mass and velocity of the freely falling ram and the attached upper die.

#### **Bolster plate**

Plate attached to the press bed having holes, T-slots, or other means for attaching the lower die or die shoe.

#### **Brake**

Mechanism for stopping or preventing motion.

#### **Chain conveyor**

A conveyor in which one or more chains (including those with paddles or bars attached to them) move the conveyor. Specific examples of chain conveyors include drag, rolling, pusher bar, pusher chain and sliding chain conveyors.

#### **Channel blanking**

A feature that allows a safety light curtain system to be programmed to ignore objects. Also called "fixed blanking."

#### **Chipper**

A machine that cuts material into chips.

#### **Chuck**

A revolving clamp-like device used for holding and driving the work piece.

#### **Clutch**

A mechanism to couple the flywheel to the crankshaft. When engaged, it allows the driving force to be transmitted to the press slide.

#### **Comb**

See feather board.

#### **Concurrent**

Occurring at the same time.

#### **Cone pulley**

A pulley having two or more steps in a conical shape for driving machinery.

#### **Cone and plug wheels (Types 16, 17, 18, 18R, and 19)**

Abrasive wheels manufactured with blind hole threaded bushings. They may be used on all surfaces except the flat mounting surface. Specific characteristics of the different cone and plug wheels are:

- Type 16 cones have a curved side with a nose radius.
- Type 17 cones have straight sides with or without a nose radius.
- Type 18 and 18R plug wheels are cylindrical in shape with either a square or curved grinding end.
- Type 19 cone wheels are a combination of cone and plug shapes.

**Control system**

Sensors, manual input and mode selection elements, interlocking and decision-making circuitry, and output elements of the press-operating devices and mechanisms.

**Coping-notching**

Where the edge or periphery of the work piece is sheared.

**Counterbalance**

Mechanism used to balance or support the weight of the connecting rods, slide, and slide attachments.

**Cutting-off wheels**

Abrasive wheels used to cut material such as masonry, pipe, etc.

**Cutting tool or saw blade**

A tool used on a metal sawing machine.

**Cycle**

The complete movement of the ram from its starting position and return to that same starting position.

**Dado**

A straight-sided groove, perpendicular to the face of the work piece, having a width greater than the thickness of a single saw blade.

**Device**

A control or attachment that is any of the following:

- Restrains the operator from inadvertently reaching into the hazardous area.
- Prevents normal or hazardous operation if any part of an individual's body is inadvertently within the hazardous area.
- Automatically withdraws the operator's hands, if the operator's hands are inadvertently within the hazardous area during the hazardous portion of the machine cycle.
- Maintains the operator or the operator's hands during the hazardous portion of the machine cycle at a safe distance from the hazardous area.

**Die or dies**

Tooling used in a press for shearing, punching, forming, drawing, or assembling metal or other material.

**Die enclosure guard**

Guard attached to the die shoe or stripper in a fixed position.

**Die setter**

A person who installs or removes dies from the press, and makes the necessary adjustments so the tooling functions properly and safely.

**Die setting**

Process of installing or removing dies, and adjusting the dies, other tooling and the safeguarding guards or devices.

**Die shoe**

Plate or block that a die holder is mounted on. It functions primarily as a base for the complete die assembly and, if used, is bolted or clamped to the bolster plate or the face of the slide.

**Die shutheight**

Actual or design dimension between the mounting surfaces of a die.

**Divider**

A machine that mechanically divides the dough into pieces of predetermined volume or weight.

**Dough sheeter**

See **sheeter**.

**Dressed**

When material is removed from the cutting surfaces of an abrasive wheel to expose new sharp cutting surfaces.

**Drilling/boring machine**

A single or multiple spindle machine that uses a rotating cylindrical tool such as a drill, a counterboring tool, and similar tools to produce a hole, blind hole, counterbore, countersink, and similar cavities in work pieces. A work support means is provided to feed the tool into the work piece or the work piece into the tool.

**Dross**

Waste product or impurities formed on the surface of molten metal.

**Dump bin and blender**

That part of the flour handling system where the containers of flour are emptied.

**Face of the slide**

Surface of the slide to which the punch or upper die is generally attached.

**Feather board/comb**

A work-guiding and hold-down device consisting of stock with a series of spring-like fingers along the edge, set and positioned at an angle to the work piece.

**Feeding**

Placing material in or removing it from the point of operation.

**Fence**

A device used to locate and guide a work piece relative to the cutting tool.

**Fixed barricade**

A guard attached to a fixed surface used to enclose a hazardous area and prevent employees from placing any part of their body into the point of operation.

**Fixed barrier guard**

A guard attached to the frame, bolster, or other surface to enclose all or part of the point of operation or other hazard area.

**Fixed blade**

A stationary blade having one or more cutting edges.

**Fixed blanking**

A feature that allows a safety light curtain system to be programmed to ignore objects. Also called "channel blanking."

**Fixture/jig**

A device used to locate, hold, or clamp one or more work pieces in a desired position.

**Flanges**

Collars, discs, or plates between or against which wheels are mounted. There are four types of flanges:

- Adaptor.
- Sleeve.
- Straight relieved.
- Straight unrelieved.

**Floating blanking (floating window)**

A feature that allows a safety light curtain system to be programmed to ignore the interruption of one or two beams within the light curtain. This allows the feeding of an object through the defined area at any point along the length of the curtain without causing it to produce a stop signal.

**Floorstand grinder**

A floor mounted, off-hand grinding machine with one or two wheels mounted on a horizontal spindle. The wheels are normally twenty-four inches or thirty inches in diameter and used for snagging operations.

**Forging**

Metal formed to a desired shape by impact or pressure in hammers, forging machines (upsetters), presses, rolls, and related forming equipment. Forging hammers, counterblow equipment, and high-energy-rate forging machines impart impact to the work piece, while most other types of forging equipment impart squeeze pressure in shaping the stock. Some metals can be forged at room temperature, but the majority of metals are made more plastic for forging with heat. Forged or drop forged parts are much stronger than poured or cast parts from foundries.

**Forging presses**

A class of forging equipment where the shaping of metal between dies is performed by mechanical or hydraulic pressure and usually is accomplished with a single workstroke of the press for each die station.

**Full revolution clutch**

Type of clutch that, when engaged, cannot be disengaged until the press has completed a single cycle (stroke).

**Gage**

See **miter gage**.

**Gap (throat)**

An opening or recess in the frame of the machine to permit positioning of material or work pieces.

**Gate or movable barrier device**

Safeguarding device that encloses the point of operation before press motion can be initiated.

**Guard (abrasive wheels)**

An enclosure designed to restrain the pieces of an abrasive wheel and furnish protection to the operator if the wheel is broken during operation.

**Guard**

A barrier that does at least one of the following:

- Prevents the hands or other body part from reaching through, over, under, or around the guard into the hazard area.
- Prevents objects or debris from falling onto or being ejected towards an employee.

**Guidepost**

The pin attached to the upper or lower die shoe. It operates within the bushing on the opposing die shoe to maintain the alignment of the upper and lower dies.

**Hazard**

A condition that could cause physical harm to a person.

**Hazard area**

An area or space that poses an immediate or impending physical hazard.

**Hog**

A machine used for cutting or grinding slabs and other coarse residue from the mill.

**Horizontal lathe**

A turning machine in which the work piece revolves about a horizontal axis. While the work is revolving, it is being shaped by cutting tools working either parallel to the axis of the work or at an angle to the axis of the work.

**Idler (pulley)**

A pulley or roller on a shaft that presses against or rests on a drive belt to guide it or take up slack.

**Inch**

Die setting mode that engages the driving clutch so a small portion of one cycle (stroke) occurs, depending upon the length of time the operator control is held actuated.

**Indirect recirculating ovens**

Ovens that are equipped with a gas-tight duct system, a furnace, and a circulating fan. Combustion gases are circulated through this enclosed system and mixed with fresh combustion gases generated by the burner in the combustion chamber. A vent or overflow removes a portion of the gases to make room for the fresh gases added by the burner. No unburned gases or products of combustion enter the baking chamber.

**Interlocked barrier guard**

Barrier attached to the press frame and interlocked with the press control system so the press stroke cannot be started normally unless the guard, or its hinged or movable sections, enclose the point of operation.

**Inverted swing and jump saws**

Saws with a saw blade starting position below the table, where the blade must travel through the horizontal plane of the tabletop to make the cut on the stock.

**Ironworker**

A machine with multiple workstations at which various operations may be performed singly or simultaneously, including but not limited to:

- Punching;
- Shearing;
- Notching;
- Coping; and
- Forming.

**Jig**

See **fixture**.

**Jog**

Die setting mode where intermittent motion is imparted to the slide by momentary operation of the drive motor after the flywheel is at rest and the clutch is engaged.

**Jointer**

A machine that has a cylindrical cutter head with more than one knife or cutting edge. It has an adjustable in-feed means of work support, or an adjustable cutter head or knives, as well as a fence or other work piece guide.

**Jump saw**

A machine that utilizes a means of work support and hold down, and has a powered arbor on an arm that pivots about a point located behind the saw arbor at approximately the same height. At rest position the saw blade is below the work piece. See **inverted swing and jump saws**.

**Kerf**

The slot made by a saw blade as it saws through a work piece.

**Kickback**

The uncontrolled propulsion or self-feed type action of a work piece in the direction of the rotation or travel of the working portion of the saw, cutting tool, sanding belt, or sanding head.

**Live roller conveyer**

A series of rollers with objects moving over them through power to all or some of the rollers. The power is usually transmitted by a belt or chain.

**Mandrel**

Tooling or a machine component used to provide internal support. It can be a spindle or shaft on which a tool is mounted, such as a drill bit.

**Manlift**

A device consisting of a power-driven endless belt moving in one direction only, and provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.

**Manual feeding**

The operator puts material or the part being processed into the press for each cycle (stroke).

**Maximum exposure angle**

The largest part of a wheel that does not need to be covered by a safety guard.

**Miter gage**

A device used as a work piece pusher, guided by a table groove.

**Miter saw**

A cutoff saw with a means of work support. It utilizes a powered arbor on an arm that pivots about a point located behind the saw arbor at approximately the same height. The saw arbor may also slide vertically. In the at-rest position, the saw blade is above the maximum capacity work piece.

**Mode**

The state or condition of the control system that allows specific operations of the machine.

**Modified Types 6 and 11 wheels (terrazzo)**

Similar to Type 6 "straight cup" wheels and Type 11 "flaring cup" wheels except for the bottom of the cup. The bottom of the cup is flat in Type 6 and 11 wheels. The modified wheels have bottoms that are sloped downwards towards the mounting hole. These modified wheels need to be mounted using a special tapered flange furnished by the tool manufacturer. These wheels are used in the terrazzo trade.

**Molding machine**

A machine that uses more than one arbor-mounted cylindrical, rotating cutting tool. It also uses power feeding, where once a work piece is engaged, it carries the work piece linearly through the balance of the intended operations, without further operator action. Operations can be performed on all surfaces of a work piece. Work pieces can be hopper- or hand-loaded and are fed ribbon-style into the machine.

**Mortiser**

A machine designed to produce a square or rectangular cavity through use of a moving, forming, or reciprocating tool. Means are provided to clamp and support the stock, and either move the stock into the tool or the tool into the stock.

**Moulder**

A machine in which the dough pieces are shaped and formed prior to final proofing.

**Mounted wheels**

Bonded abrasive wheels of various shapes, usually two inches diameter or smaller, that are secured to plain or threaded steel shafts or mandrels.

**Movable barrier device**

See **gate or movable barrier device**.

**Nip-point belt and pulley guard**

A guard that encloses the pulley and has rounded or rolled edge slots for the belt to pass through.

**Off-hand grinding**

Grinding of a work piece that is held in the operator's hand.

**Overland conveyer**

A single or series of belt conveyors designed to carry bulk material long distances, usually following the general contour of the land.

**Part revolution clutch**

Type of clutch that can be disengaged before the press slide completes a full stroke.

**Pedestal grinder**

An off-hand grinding machine similar to a bench grinder mounted on or otherwise attached to a floor-mounted pedestal.

**Pinch point**

Any point, other than the point of operation, where it is possible for a part of the body to be caught between moving parts or between a moving part and stationary one.

**Planer**

A machine with at least one cylindrical cutter head, that includes one or more inserted knife or cutting edge. A planer has a cutter head mounted over a means of work support. It also uses either an adjustable work support or cutter head to size the stock. The work piece is usually power-fed.

**Point of operation**

The area on a machine where work is actually performed upon the material being processed.

**Power-driven hammers**

Types of drop hammers in which the ram is raised for each stroke by a double-action steam, air, or hydraulic cylinder, and the energy delivered to the work piece is supplied by the velocity and weight of the ram and attached upper die driven downward by steam, air, or hydraulic pressure. Energy delivered during each stroke may be varied.

**Power transmission parts**

The mechanical components of a piece of equipment that, together with a source of power (sometimes referred to as a prime mover), provide the motion to a part of a machine or piece of equipment.

**Presence-sensing device**

A device that creates a sensing field, area, or plane to detect the presence of an individual or object.

**Presence-sensing device initiation (PSDI)**

Operating mode of a mechanical power press where a single cycle (stroke) is initiated by a presence-sensing device when it senses that the operator has finished feeding or removing parts and all parts of the operator's body are withdrawn from the sensing field of the device.

**Pull-back device**

A device attached to the operator's hands and connected to the upper die or slide of the press that will pull the operator's hands out of the point of operation as the dies close.

**Push block**

A nonmetallic device with one or more handles. A push block also has a flat bottom surface with either a heel or friction material on it, used as a hold-down and feed device. The purpose of this is to provide a safe distance between the hands and the cutting tool.

**Pusher-bar conveyor**

Two endless chains cross-connected at intervals by bars or pushers that propel the load along the bed or trough.

**Push stick**

A nonmetallic stick shaped device designed to provide a safe distance between the hands and the cutting tool. It has, as part of its design, a notched end with a heel and toe to hold down and feed the work piece past the cutting tool.

**Racks**

Carriers of pans, panned dough and bakery products. They are usually constructed of metal and mounted on casters or provided with trolleys for use on a monorail system.

**Reinforced wheels**

Organic bonded abrasive wheels which have webbing, fabric or filament to provide resistance to complete breaking of the wheel should it become cracked or damaged.

**Repeat**

An unintended or unexpected successive stroke of the press resulting from a malfunction.

**Restraint device**

A device with attachments for the operator's hands and wrists that prevent the operator from reaching into the hazardous area.

**Return-belt idlers**

A roller that supports the return run of the conveyor belt.

**Ripping**

A sawing operation made through the thickness of the work piece with the grain of natural wood, along the long dimension of a rectangular work piece, and usually parallel to that edge on reconstituted wood products. Two or more pieces result from the operation.

**Rivet-making machines**

The same as upsetters and bolt-headers when producing rivets with stock diameter of one inch or more.

**Riving knife**

See **spreader**.

**SFPM**

See **surface feet per minute**.

**Safeguarding by location**

Because of its location, no employee can inadvertently come in contact with a hazard during operation, maintenance, or servicing.

**Safeguarding by distance**

Employees are kept far enough from a hazard that they will not contact or be injured by the hazard.

**Safeguarding device**

See **device**.

**Safety block**

A prop inserted between the upper and lower dies or between the bolster plate and the face of the slide to prevent the slide from falling of its own weight.

**Safety cylinder**

This safety device may be of the direct cushion type integral with the main cylinder or it may be of the separate cushion type whereby a constant supply of live steam or air is applied behind a separate piston adjacent to the main cylinder. A spring, suitably constrained, may also be employed.

**Safety cylinder head**

An air cushion at the top of the hammer, just below the head, to protect the head from damage by the piston.

**Scale**

Any layer or leaf of metal resembling the scale of a fish in size and thinness; such as a scale of iron.

**Screw conveyor**

A screw or auger that revolves in a suitably shaped trough or casing, used to move material in one specific direction.

**Shaper**

A machine that uses one or more vertical spindles that are either fixed or able to be tilted, usually with an arbor mounted rotating cylindrical cutter, to form decorative or functional forms on a manually or power-fed work piece. The work piece is supported on a stationary or moving table. A guide, fixture, or template is used to control the operation. The spindle can be mounted above or below the work support means.

**Sheeter**

A machine that forms dough into a sheet by compression through one or more sets of driven rolls.

**Sifter**

A device that sifts flour. Sifter types are brush, oscillating, or vibrating.

**Single stroke mechanism**

Used on a full revolution clutch to limit the travel of the slide to one complete stroke at each engagement of the clutch.

**Slat and roller slat conveyor**

A conveyor employing one or more endless chains to which nonoverlapping, noninterlocking, spaced slats are attached.

**Slide**

Part of the press that moves back and forth in a straight line. Also called a ram, plunger, or platen.

**Snagging**

Grinding which removes relatively large amounts of material without regard to close tolerances or surface finish.

**Spreader**

A flat metal device slightly narrower than the saw kerf. It is designed to prevent the saw blade kerf in the work piece from closing on the sides of the blade during a sawing operation.

**Steam hammers**

A type of drop hammer where the ram is raised for each stroke by a double-action steam cylinder and the energy delivered to the work piece is supplied by the velocity and weight of the ram and attached upper die driven downward by steam pressure. Energy delivered during each stroke may be varied.

**Stripper**

A mechanism or die part for removing parts or material from the punch.

**Surface feet per minute (SFPM)**

A measure of the speed of a point on the periphery (outer edge) of an abrasive wheel. It is calculated using the formula:  
SFPM = .262 x diameter of the wheel (in inches) x RPM (revolutions per minute)

Example:

Wheel diameter = 24 inches

Spindle speed = 1000 RPM

SFPM = .262 x 24 x 1000 = 3,144 SFPM

**Sweep device**

A single or double arm (rod) attached to the upper die or slide of the press that is designed to move the operator's hands to a safe position as the dies close. Sweep devices are not allowed for point-of-operation safeguarding.

**Swing saw/overhead swing cutoff saw**

A machine with a means of work support using a powered arbor and circular saw blade that pivots about a point located above the saw arbor.

**Tenoning machine**

A machine designed to use two or more cylindrical cutters, or one or two circular saws, to size or prepare (or both) the ends of a work piece. The work piece is supported on a table or conveying means. A means for clamping the work piece is provided.

**Terrazzo**

A material of stone chips, such as marble, set in mortar and polished.

**Threaded hole wheels**

Abrasive wheels that have one central threaded bushing, securely anchored in place. They are mounted by being screwed onto a threaded machine spindle so that the wheel back seats firmly against an unrelieved flat back flange.

**Tongs**

Metal holder used to handle hot or cold forgings.

**Tongue guard**

An integral part of a safety guard that is located where the upper exposed part of the abrasive wheel meets the safety guard. It can be adjusted as necessary to maintain a set distance from the constantly decreasing diameter of the wheel.

**Tooling**

Elements for guiding or imparting a desired configuration to the material.

**Top grinding**

Grinding done above the horizontal centerline of the wheel.

**Towed conveyor**

An endless chain supported by trolleys from an overhead track or running in a track on the floor with means for towing floor-supported trucks, dollies, or carts.

**Trimming presses**

A class of auxiliary forging equipment that removes flash (metal splash) or excess metal from a forging. This trimming operation can also be done cold, as in can coining, a product-sizing operation.

**Trip (or tripping)**

Momentary actuation of the activating control to initiate the cycle (stroke).

**Trued**

When the cutting surfaces of an abrasive wheel have been reshaped to expose new sharp cutting surfaces.

**Turnover bar**

A bar used in die setting to manually turn the crankshaft of the press.

**Two-hand device**

A device that requires the concurrent use of both of the operator's hands to both initiate and continue the machine cycle during the hazardous portion of the machine cycle.

**Two-hand trip device**

A device that requires concurrent operation of the trip controls or levers by the operator's hands to initiate the machine cycle.

**Type A movable gate**

A device that encloses the hazardous area when the machine cycles and does not open until the end of the cycle.

**Type B movable gate**

A device that encloses the hazardous area when the machine cycles and opens when hazardous motion of the cycle is over. Type B devices are not allowed on full revolution type machinery.

**Type 1 wheel**

An abrasive wheel shaped like a disc with a mounting hole in the middle. Sometimes called a "straight wheel." It has diameter (D), thickness (T), and hole size (H) dimensions. Grinding is normally done on the periphery (outside curve) of the wheel (T dimension). Can be used for grinding, cutting-off, and tuck pointing.

**Type 2 wheel**

An abrasive wheel shaped like an open-ended, hollow cylinder. Sometimes called a cylinder wheel. It has diameter (measured from the outer wall of the cylinder), wheel thickness (height of the cylinder), and rim thickness (thickness of the cylinder wall). Grinding is done on the end of the cylinder (rim thickness dimension).

**Type 6 wheel**

An abrasive wheel shaped like a straight-sided cup or bowl with a mounting hole in the bottom of the cup. Sometimes called a "cup wheel." It has diameter (D), thickness (T), hole size (H), rim thickness (W), and back thickness (E) dimensions. Grinding is normally done on the cup rim (W dimension).

**Type 11 wheel**

An abrasive wheel shaped like a cup or bowl with a mounting hole in the bottom of the cup. The sides of the cup are not straight-sided but are angled outward. Sometimes called a "flaring cup wheel" since the sides are "flared" out. It has double diameter dimensions (top D and bottom J). It also has thickness (T), hole size (H), rim thickness (W) and back thickness (E) dimensions. Grinding is normally done on the cup rim (W dimension).

**Type 16, 17, 18, 18R, and 19 wheels**

See cone and plug wheels.

**Type 27 wheel**

An abrasive wheel similar to a Type 1 wheel, but the center of the wheel around the mounting hole is pushed back (depressed). Sometimes called a "depressed center" wheel. It has diameter (D), thickness (U) and hole size (H) dimensions. The depressed center allows grinding on the flat surface of the wheel without interference from the flange or mounting hardware.

**Type 27A cutting-off wheel**

Similar to a Type 27 wheel. Specifically designed for use on cutting-off machines.

**Type 28 wheel**

An abrasive wheel similar to a Type 27 wheel, but the face of the wheel is angled upward and away from the mounting hole. The face of a Type 27 wheel is flat and perpendicular to the mounting hole. A Type 28 wheel is also called a "depressed center" wheel. It has diameter (D), thickness (U)

and hole size (H) dimensions. The depressed center allows grinding without interference from the mounting. A Type 28 wheel has a saucer-shaped grinding rim and is designed for corner grinding and side grinding.

**Type 29 wheel**

An abrasive wheel that has reversed, saucer-shaped grinding rims (similar to a partially opened umbrella).

**Unitized tooling**

A die that has the upper and lower members incorporated into a self-contained unit that holds the die members in alignment.

**Upsetters (or forging machines, or headers)**

A type of forging equipment, related to the mechanical press, in which the main forming energy is applied horizontally to the work piece that is gripped and held by prior action of the dies.

**Wood products**

Wood products include wood and reconstituted wood products that generate chips or dust in the processing of a wood piece.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-028, § 296-806-500, filed 6/29/04, effective 1/1/05.]

**Chapter 296-807 WAC**

**PORTABLE POWER TOOLS**

**WAC**

- 296-807-100 Scope.
- 296-807-110 Switches (controls).
- 296-807-11005 Make sure switches are safe.
- 296-807-120 Portable circular saws.
- 296-807-12005 Make sure portable circular saws are safe to use.
- 296-807-130 Portable belt sanding machines.
- 296-807-13005 Guard portable belt sanding machines.
- 296-807-140 Compressed air tools.
- 296-807-14005 Follow the manufacturer's instructions.
- 296-807-14010 Prevent air tools from ejecting attachments.
- 296-807-14015 Protect employees from contact with compressed air.
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- 296-807-14025 Make sure air hose and plastic pipe supplying compressed air to portable air tools are safe.
- 296-807-14030 Make sure air tools are adequately designed and constructed.
- 296-807-14035 Use air tools safely.
- 296-807-14040 Make sure fastener driving air tools (nailers and staplers) are safe.
- 296-807-150 Powder actuated fastening systems.
- 296-807-15005 Make sure tool operators are qualified.
- 296-807-15010 Make sure employees are aware tools are in use and wear appropriate personal protective equipment (PPE).
- 296-807-15015 Make sure tools are adequately designed and constructed.
- 296-807-15020 Make sure tools and containers are properly labeled.
- 296-807-15025 Make sure powder loads and power levels are properly identified.
- 296-807-15030 Use proper powder loads.
- 296-807-15035 Make sure the tool is appropriate to the job.
- 296-807-15040 Make sure the operator uses the tool safely.
- 296-807-15045 Use fasteners safely.
- 296-807-15050 Inspect and maintain tools properly.
- 296-807-15055 Make sure tools are stored properly.
- 296-807-160 Power lawnmowers.
- 296-807-16005 Make sure equipment meets minimum design and construction requirements.
- 296-807-16010 Make sure the equipment has the appropriate labels and decals.
- 296-807-16015 Make sure the operator understands and follows instructions before starting the mower.
- 296-807-16020 Use the equipment safely.
- 296-807-16025 Protect employees from fuel and exhaust.
- 296-807-16030 Use walk-behind mowers safely.

- 296-807-16035 Use ride-on mowers safely.
- 296-807-170 Jacks.
- 296-807-17005 Make sure jacks are labeled with their rated load(s).
- 296-807-17010 Make sure the jack is safe to lift the load.
- 296-807-17015 Lift the load safely.
- 296-807-17020 Visually inspect jacks and keep them in good working order.
- 296-807-180 Portable tools using abrasive wheels.
- 296-807-18005 Make sure abrasive wheels and tools are properly designed and constructed.
- 296-807-18010 Make sure machines have safety guards.
- 296-807-18015 Keep safety guards in good functional condition.
- 296-807-18020 Use specific safety guards for machines using Type 1 grinding wheels, cutting-off wheels, and tuck pointing wheels.
- 296-807-18025 Use specific safety guards for vertical and angle grinders using Type 6 or Type 11 wheels.
- 296-807-18030 Use specific safety guards for vertical and angle grinders using Type 27, 28 and 29 wheels.
- 296-807-18035 Use side handles on vertical and angle grinders.
- 296-807-18040 Make sure abrasive wheels are safe to use.
- 296-807-18045 Mount wheels properly.
- 296-807-18050 Use proper flanges.
- 296-807-18055 Make sure flanges are in good condition.
- 296-807-18060 Use specific flanges for Type 1 cutting-off wheels.
- 296-807-18065 Use specific flanges for Type 27A cutting-off wheels.
- 296-807-18070 Use specific flanges for threaded hole wheels.
- 296-807-18075 Use specific flanges for cup, cone or plug wheels with threaded inserts or projecting studs.
- 296-807-18080 Use blotters when required.
- 296-807-18085 Meet specific blotter requirements when using modified Types 6 and 11 wheels (terrazzo).
- 296-807-190 Definitions.

**WAC 296-807-100 Scope.** This chapter applies to the tools and equipment shown in Table 1, Scope of this chapter.

**Table 1  
Scope of this Chapter**

Section:	Applies to:
110 Switches (controls)	Hand-held portable power tools.
120 Portable circular saws	Hand-held portable circular saws.
130 Portable belt sanding machines	Hand-held portable belt sanding machines.
140 Compressed air tools, hose, and pipe	Hand-held portable compressed air powered tools. It also applies to air hose and plastic pipe used to supply compressed air to these tools.
150 Powder actuating fastening systems	Powder actuated fastening systems designed to use the expanding gases from a powder load to propel a stud, pin, fastener, or other object into hard structural material.
160 Power lawnmowers	Consumer and commercial power lawnmowers.
170 Jacks	Portable hand- or power-operated: <ul style="list-style-type: none"> <li>• Hydraulic jacks</li> <li>• Mechanical ratchet jacks</li> <li>• Mechanical screw jacks.</li> </ul>
180 Portable tools using abrasive wheels	Portable tools using abrasive wheels.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-100, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-110 Switches (controls). Summary.**

#### **Your responsibility:**

Make sure hand-held portable power tools have safe switches (controls).

#### **Exemption:**

WAC 296-807-110 does not apply to:

- Concrete vibrators
- Concrete breakers
- Powered tampers
- Jack hammers
- Rock drills
- Garden appliances
- Household and kitchen appliances
- Personal care appliances
- Medical or dental equipment
- Fixed machinery.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-110, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-11005 Make sure switches are safe.**

#### **You must:**

(1) Make sure the operating switch is located in a position that makes it difficult to accidentally operate the tool.

(2) Use the correct operating switch.

- Make sure hand-held gasoline-powered chain saws have a constant pressure throttle control that will shut off power to the chain when the pressure is released.
- Use a constant pressure switch that will shut off the power when the switch is released to turn on or operate any hand-held power tool.

#### **Exemptions:**

• Some tools can use a lock-on feature with the constant pressure switch if the lock-on feature can be turned off with a single motion of the same finger(s) that turned it on. You can use a lock-on feature with these hand-held tools:

- Drills
- Tappers
- Fastener drivers
- Grinders using a wheel greater than two inches in diameter
- Disc sanders
- Belt sanders
- Reciprocating saws
- Saber, scroll and jig saws using a blade with a shank width greater than one-quarter inch
- Other similarly operating powered tools.
- You can use a positive "on-off" switch with these hand-held tools:
  - Platen sanders
  - Grinders using a wheel two inches or less in diameter
  - Routers
  - Planers
  - Laminate trimmers
  - Nibblers
  - Shears
  - Saber, scroll and jig saws using a blade with a shank width of one-quarter inch ( $\pm$  .05 inch) or less.

[Title 296 WAC—p. 2812]

**Note:** The shank width of saber, scroll and jig saw blades is measured at the narrowest point on the blade shank.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-11005, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-120 Portable circular saws.**

#### **Your responsibility:**

Make sure portable circular saws are safe.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-120, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-12005 Make sure portable circular saws are safe to use.**

#### **You must:**

(1) Use a constant pressure switch to turn on or operate any circular saw using a blade that has a diameter greater than two inches.

(2) Remove cracked saws and saw blades from service.

(3) Make sure power driven circular saws that have a blade diameter larger than two inches have guards above and below the base plate (shoe) as listed in Table 2, Portable circular saw guarding requirements.

**Table 2**  
**Portable Circular Saw Guarding Requirements**

<b>Upper Guard</b>	<b>Lower Guard</b>
Covers the blade to the depth of the teeth, except for the minimum arc necessary to allow the base to tilt for bevel cuts.	Covers the blade to the depth of the teeth, except for the minimum arc necessary to allow proper: <ul style="list-style-type: none"> <li>• Retraction of the guard</li> <li>• Contact with the work.</li> </ul> Automatically and instantly returns to the position covering the blade when the saw is withdrawn from contact with the work.

**Exemption:** Guarding requirements in subsection (3) of this section do not apply to saws used in the meat cutting industry to cut meat.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-12005, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-130 Portable belt sanding machines.**

#### **Your responsibility:**

Make sure portable belt sanding machines are safe.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-130, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-13005 Guard portable belt sanding machines.**

#### **You must:**

- Guard:
  - Nip points where the sanding belt runs onto a pulley
  - The unused run of the sanding belt.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-13005, filed 4/4/03, effective 8/1/03.]

(2007 Ed.)

**WAC 296-807-140 Compressed air tools. Summary.**

This section applies to portable, hand-held compressed air powered tools. It also applies to airhose and plastic pipe used to supply compressed air to these tools.

**Your responsibility:**

Make sure compressed air and compressed air tools are used safely.

**You must:**

**GENERAL TOOL REQUIREMENTS**

**Follow the manufacturer's instructions**

WAC 296-807-14005

**Prevent air tools from ejecting attachments**

WAC 296-807-14010

**CONTACT WITH COMPRESSED AIR**

**Protect employees from contact with compressed air**

WAC 296-807-14015

**CLEANING**

**Make sure safeguards are used when cleaning with compressed air**

WAC 296-807-14020

**AIRHOSE AND PLASTIC PIPE**

**Make sure airhose and plastic pipe supplying compressed air to portable air tools are safe**

WAC 296-807-14025

**TOOL DESIGN AND CONSTRUCTION**

**Make sure air tools are adequately designed and constructed**

WAC 296-807-14030

**TOOL USE**

**Use air tools safely**

WAC 296-807-14035

**FASTENER DRIVING TOOLS**

**Make sure fastener driving air tools (nailers and staplers) are safe**

WAC 296-807-14040.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-140, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-14005 Follow the manufacturer's instructions.**

**You must:**

**• Follow the manufacturer's instructions for safe use of the tool.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14005, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-14010 Prevent air tools from ejecting attachments.**

**You must:**

**• Make sure the tool cannot accidentally eject an attachment.**

**Note:** A retainer is needed if the tool does not have a positive method of keeping the attachment in the tool.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14010, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-14015 Protect employees from contact with compressed air.**

**You must:**

**• Make sure a tool nozzle or an airhose opening is not:**  
– Pointed at anyone

– Allowed to contact a person's body.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14015, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-14020 Make sure safeguards are used when cleaning with compressed air.**

**You must:**

**• Use the following when cleaning with compressed air:**

– Air pressure that has been reduced to less than 30 p.s.i. static pressure at the nozzle

– Effective chip guarding.

**Note:** ■ You may use air pressure greater than 30 p.s.i. if you use a nozzle with vents, holes, flaps or slots that will direct the air flow away from the tip of the nozzle and will reduce the air flow to less than 30 p.s.i if the nozzle becomes blocked.

■ Effective chip guarding means any method or equipment that protects the eyes and skin of the cleaner and other workers from flying chips or particles. Examples include:

- A protective cone around the nozzle to protect the cleaner
- Barriers, baffles or screens to protect other workers.

**Reference:** Appropriate personal protective equipment (PPE) needs to be worn when cleaning with compressed air. See WAC 296-800-160 in the safety and health core rules.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14020, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-14025 Make sure airhose and plastic pipe supplying compressed air to portable air tools are safe.**

**You must:**

(1) Make sure the airhose and hose connections are suitable for the:

- Air pressure
- Use.

(2) Make sure any plastic pipe used to supply compressed air for portable air tools has been specifically identified by the manufacturer as being suitable for compressed air use.

**Note:** Existing unapproved pipe that is buried underground or enclosed in shatter-resistant material is acceptable only if it completely eliminates the hazards created by the brittle nature of the pipe.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14025, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-14030 Make sure air tools are adequately designed and constructed.**

**Exemption:**

This section does not apply to:

- Tools specifically for medical or dental use
- Tools specifically for use in the food processing industry
- Tools mounted in stationary installations
- Air hoists
- Construction and mining tools such as paving breakers, diggers, tampers, and rock drills.

**You must:**

• Make sure portable, hand-held air tools meet the requirements of:

– ANSI B186.1-1984, Safety Code for Portable Air Tools.

**OR**

– ANSI/ISANTA SNT-101-1993, Portable, Compressed-Air-Actuated, Fastener Driving Tools-Safety Requirements for.

**Note:** There may be a statement on the tool or in the instruction manual indicating the tool meets the requirements of the appropriate ANSI standard. If in doubt, check with the manufacturer.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14030, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-14035 Use air tools safely.**

#### **Exemption:**

This section does not apply to:

- Tools specifically for medical or dental use
- Tools specifically for use in the food processing industry
- Tools mounted in stationary installations
- Air hoists
- Construction and mining tools such as paving breakers, diggers, tampers, and rock drills.

#### **You must:**

(1) Relieve the pressure in the air line before disconnecting a compressed air tool from the line or disconnecting a hose joint unless there is automatic valve closing protection at the joint being separated.

(2) Disconnect the tool from the compressed air supply before repairs are done.

(3) Make sure that eye protection is worn at all times by:

- The person operating the tool
- Other persons in the area where tools are being used.

**References:** ■ Use the PPE hazard assessment to determine which employees other than the tool operator need to wear eye protection and the type of eye protection they need to wear. See WAC 296-800-160 in the safety and health core rules.  
■ Chapter 296-62 WAC, Part K, Hearing conservation, may require the use of hearing protection.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14035, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-14040 Make sure fastener driving air tools (nailers and staplers) are safe.**

#### **You must:**

(1) Make sure any fastener driving air tool discharges all air in the tool when disconnected from the compressed air supply.

(2) Make sure that all pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

**Note:** Pneumatic nailers or staplers do not need this safety device if:

- The overall weight of the fastening device does not exceed the weight of one and one-half inches of standard 18-gauge wire. The normal maximum diameter tolerance for manufacturing standard 18-gauge wire is .045 inches.
- The operator and any other person within twelve feet of the point of operation wear approved eye protection.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-14040, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-150 Powder actuated fastening systems. Summary.**

#### **IMPORTANT:**

[Title 296 WAC—p. 2814]

This section applies to any powder actuated fastening system designed to use the expanding gases from a powder load to propel a stud, pin, fastener, or other object into hard structural material.

#### **Exemption:**

This section does not apply to:

- Devices designed to attach objects to soft construction material such as wood, plaster, tar, and dry wallboard
- Stud welding equipment.

#### **Your responsibility:**

Make sure powder actuated fastening systems are used safely.

#### **You must:**

##### **TOOL OPERATORS**

#### **Make sure tool operators are qualified**

WAC 296-807-15005

##### **PERSONAL PROTECTIVE EQUIPMENT**

#### **Make sure employees are aware tools are in use and wear appropriate personal protective equipment (PPE)**

WAC 296-807-15010

##### **TOOL DESIGN AND CONSTRUCTION**

#### **Make sure tools are adequately designed and constructed**

WAC 296-807-15015

##### **LABELING**

#### **Make sure tools and containers are properly labeled**

WAC 296-807-15020

##### **POWDER LOADS**

#### **Make sure powder loads and power levels are properly identified**

WAC 296-807-15025

#### **Use proper powder loads**

WAC 296-807-15030

##### **TOOL USE**

#### **Make sure the tool is appropriate to the job**

WAC 296-807-15035

#### **Make sure the operator uses the tool safely**

WAC 296-807-15040

##### **FASTENERS**

#### **Use fasteners safely**

WAC 296-807-15045

##### **INSPECTION AND MAINTENANCE**

#### **Inspect and maintain tools properly**

WAC 296-807-15050

##### **STORAGE**

#### **Make sure tools are stored properly**

WAC 296-807-15055

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-150, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-15005 Make sure tool operators are qualified.**

#### **You must:**

- Make sure tools are used only by qualified operators
- Make sure operators have been trained by an authorized instructor.

**Note:** Authorized instructors have to meet the instructor qualifications of ANSI A10.3-1995, Safety Requirements for Powder-Actuated Fastening Systems.

#### **You must:**

- Make sure all tool operators can:

- Understand the manufacturer's instructions
- Clean the tool properly
- Recognize any visibly worn or damaged parts
- Identify power load levels
- Operate the tool correctly.
- Make sure tool operators have a valid qualified operator's card in their possession when they are using the tool.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15005, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15010 Make sure employees are aware tools are in use and wear appropriate personal protective equipment (PPE).**

**You must:**

- (1) Make sure eye or face protection is worn by:
- Tool operators
  - Assistants
  - Persons close to where the tool is being used.

**Reference:** ■ Use the PPE hazard assessment to determine which employees other than the tool operator need to wear eye protection and the type of eye protection they need to wear. See WAC 296-800-160 in the safety and health core rules.  
 ■ Chapter 296-62 WAC, Part K, Hearing conservation may require the use of hearing protection.

**You must:**

- (2) Post signs where tools are being used and in adjacent areas where tool use could pose a hazard. Signs must:
- Be easily seen
  - Be at least 8 x 10 inches (20 x 25 cm)
  - Use letters in boldface type at least one inch (2.5 cm) high
  - Read "POWDER ACTUATED TOOL IN USE" or similar wording.

**Note:** Tool use could create a hazard in adjacent areas by allowing a fastener to penetrate one or more of the following:

- Wall
- Floor
- Other working surface.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15010, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15015 Make sure tools are adequately designed and constructed.**

**You must:**

- (1) Make sure the tool meets the design and construction requirements of the American National Standards Institute (ANSI) standard ANSI A10.3-1995, Safety Requirements for Powder-Actuated Fastening Systems.

**Note:** There may be a statement on the tool or in the instruction manual indicating the tool meets the requirements of the appropriate ANSI standard. If in doubt, check with the manufacturer.

**You must:**

- (2) Make sure each tool has:
- Operator instructions and a tool service manual
  - Powder load and fastener chart
  - Service tools and accessories.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15015, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15020 Make sure tools and containers are properly labeled.**

**You must:**

- (1) Make sure tools are properly labeled.
- Make sure each tool has a readable, permanent label that shows the manufacturer's:
    - Model number
    - Unique serial number.
  - Make sure there is a durable warning label on each tool that:

– Reads "WARNING - FOR USE ONLY BY QUALIFIED OPERATORS ACCORDING TO MANUFACTURER'S INSTRUCTION MANUAL"

**OR**

– Uses words with the same meaning.

- (2) Make sure the tool storage container has these labels:

- "POWDER ACTUATED TOOL" on the outside of the container in an easily seen position
- "WARNING - POWDER ACTUATED TOOL. TO BE USED ONLY BY A QUALIFIED OPERATOR AND KEPT UNDER LOCK AND KEY WHEN NOT IN USE" on the inside cover.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15020, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15025 Make sure powder loads and power levels are properly identified.**

**You must:**

- Make sure powder loads and power levels are identified as specified in Table 3, Powder-Load Identification

**Table 3  
Powder-Load Identification**

	Power Level	Color Identification	
		Case Color	Load Color
Lowest Level	1	Brass	Gray
	2	Brass	Brown
	3	Brass	Green
	4	Brass	Yellow
	5	Brass	Red
	6	Brass	Purple
	7	Nickel	Gray
	8	Nickel	Brown
	9	Nickel	Green
	10	Nickel	Yellow
Highest power level	11	Nickel	Red
	12	Nickel	Purple

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15025, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15030 Use proper powder loads.**

**You must:**

- Use only a powder load that is:
  - Recommended by the tool manufacturer for the particular tool

**OR**

– One that provides the same level of safety and performance.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15030, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15035 Make sure the tool is appropriate to the job.****You must:**

(1) Use the lowest velocity class of tool and load that will properly set the fastener.

(2) Use the proper shield, fixture, adaptor, or accessory that is:

- Suitable for the job
- Recommended and supplied by the manufacturer.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15035, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15040 Make sure the operator uses the tool safely.****You must:**

(1) Make sure the operator:

• Inspects the tool before using it, as recommended by the tool manufacturer

• Uses the tool according to the manufacturer's instructions

• Keeps the tool unloaded until just before using it

• Unloads the tool at once if work is interrupted after the tool has been loaded

• Does not leave a tool or powder load unattended where it would be available to an unauthorized person

• Never points a tool (loaded or unloaded) at any part of a person's body.

**Note:** A magazine or clip fed tool is not considered loaded until a powder load is actually in the ram (firing chamber).

**You must:**

(2) Make sure tools are not used in an explosive or flammable atmosphere.

(3) Do this if the tool misfires:

• Hold it firmly against the work surface for thirty seconds

**Then**

• Follow the instructions in the tool manufacturer's instruction manual.

(4) Hold the tool perpendicular to the work surface when fastening to any material.

**Exemption:**

This does not apply if the tool manufacturer recommends a different technique for a specific job.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15040, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15045 Use fasteners safely.****You must:**

(1) Use fasteners:

• Recommended by the tool manufacturer for the particular tool

**OR**

• Fasteners that provide the same level of safety and performance.

(2) Keep the fastener from passing completely through the structural material by using a backing material when driving a fastener into any material that is any of the following:

- Easily penetrated
- Thin
- Of questionable resistance.

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(3) Make sure the material is suitable for fastening. Do not drive fasteners into very hard or brittle material such as:

- Cast iron
- Glazed tile
- Hardened steel
- Glass block
- Natural rock
- Hollow tile
- Most brick.

(4) Make sure positive alignment with an existing hole is maintained by using a guide or other means supplied or recommended by the tool manufacturer before driving a fastener into the hole.

(5) Make sure fasteners are not driven into any spalled (chipped or crumbled) area.

(6) Drive fasteners into concrete only if the fastener shank will penetrate no more than one-third the thickness of the concrete.

(7) Make sure fasteners are driven at least:

- One-half inch (13 mm) from the edge of steel
- Three inches (75 mm) from the unsupported edge of masonry material.

**Exemption:**

This does not apply if an application is specifically required or recommended by the tool manufacturer.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15045, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15050 Inspect and maintain tools properly.****You must:**

• Make sure any tool that is not in proper working condition is:

– Immediately removed from service

– Tagged

– Properly repaired as specified in the manufacturer's instructions before being used again.

• Regularly service the tool and inspect it for worn or damaged parts at intervals recommended by the tool manufacturer.

• Replace worn or damaged parts before the tool is used.

This must be done:

– By a qualified person

– Using only parts supplied by the tool manufacturer.

• Keep a written record of inspection dates.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15050, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-15055 Make sure tools are stored properly.****You must:**

(1) Make sure there is a container that can be locked for each tool.

(2) Make sure tools and powder loads that are not being used are:

- Locked in a container
- Stored in a safe place
- Only available to authorized persons.

(3) Store all manuals, maintenance tools, and accessories in the tool container when they are not being used.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-15055, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-160 Power lawnmowers. Summary.**

**Exemption:**

This section does not apply to commercial equipment that is:

- Designed primarily for agricultural purposes

**OR**

• Designed primarily to be operated with tractors having at least twenty horsepower for cutting grass or other growth on highways.

**Your responsibility:**

Make sure power lawnmowers are used safely.

**You must:**

**DESIGN AND CONSTRUCTION**

**Make sure equipment meets minimum design and construction requirements**

WAC 296-807-16005

**LABELS**

**Make sure the equipment has the appropriate labels and decals**

WAC 296-807-16010

**BEFORE STARTING**

**Make sure the operator understands and follows instructions before starting the mower**

WAC 296-807-16015

**USE**

**Use the equipment safely**

WAC 296-807-16020

**NONELECTRIC MOWERS**

**Protect employees from fuel and exhaust**

WAC 296-807-16025

**WALK-BEHIND MOWERS**

**Use walk-behind mowers safely**

WAC 296-807-16030

**RIDE-ON MOWERS**

**Use ride-on mowers safely**

WAC 296-807-16035.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-160, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-16005 Make sure equipment meets minimum design and construction requirements.**

**You must:**

(1) Make sure equipment meets ANSI design and construction requirements.

- Make sure power lawnmowers manufactured on or after August 1, 2003, meet the requirements of the appropriate ANSI standard:

– ANSI B71.1-1998, American National Standard for Consumer Turf Care Equipment - Walk-Behind Mowers and Ride-On Machines with Mowers - Safety Specifications

**OR**

– ANSI B71.4-1999, American National Standard for Commercial Turf Care Equipment - Safety Specifications.

- Make sure noncommercial power lawnmowers manufactured before the effective date of this chapter meet the requirements in chapter 296-806 WAC, Machine safety.

**Note:** There may be a statement on the tool or in the instruction manual indicating the tool meets the requirements of the

appropriate ANSI standard. If in doubt, check with the manufacturer.

**You must:**

(2) Position, guard or shield all power-driven shafts, chains, belts, gears, friction drive components, nip and pinch points, and any exposed components hot enough to cause burns while:

- Starting
- Mounting
- Operating the machine.

(3) Have a shutoff device that:

- Will stop the motor or engine

**AND**

- Has to be intentionally and manually activated before the motor or engine can be restarted.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-05-027, § 296-807-16005, filed 2/7/06, effective 4/1/06; 03-09-009, § 296-807-16005, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-16010 Make sure the equipment has the appropriate labels and decals.**

**You must:**

(1) Make sure all positions of the operating controls are clearly identified.

(2) Make sure warning and caution labels or decals on the mower are readable and replace them if necessary.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-16010, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-16015 Make sure the operator understands and follows instructions before starting the mower.**

**You must:**

(1) Make sure the operator understands all instructions for operating the mower that are in the manufacturer's instructions and on the machine.

- Make sure the operator is thoroughly familiar with the controls and proper use of the mower before starting it.

(2) Make sure the proper guards, plates, grass catcher or other safety devices are in place before starting the mower.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-16015, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-16020 Use the equipment safely.**

**You must:**

(1) Follow the manufacturer's instructions for safe use of the equipment.

(2) Keep people clear of discharge opening(s).

(3) Keep people's hands and feet clear of rotating parts.

(4) Clear the area of objects such as rocks, toys, wire, bones, sticks, etc., which could be picked up and thrown by the blade and create a hazard for the operator or other persons.

(5) Make sure the operator stops the engine before:

- Leaving the equipment
- Unclogging the grass discharge chute
- Cleaning the mower.

(6) Make sure the operator wears safety goggles or safety glasses with side shields when operating the mower.

**Note:** Use the personal protective equipment (PPE) hazard assessment to determine the type of footwear and other PPE the

employees need to wear. See WAC 296-800-160, PPE, in the safety and health core rules.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-16020, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-16025 Protect employees from fuel and exhaust.**

#### **Exemption:**

This section does not apply to electric engines.

#### **You must:**

- (1) Make sure to:
  - Keep the gas cap on whenever the engine is running.
  - Shut off the engine before and during refueling.
- (2) Make sure not to refuel the machine indoors.
- (3) Make sure not to run the engine in a closed area.

#### **Exemption:**

You can refuel the machine indoors or run the engine in a closed area if the area was specifically designed for such use.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-16025, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-16030 Use walk-behind mowers safely.**

#### **You must:**

- (1) Make sure the operator wears substantial footwear when operating a walk-behind mower.

**Note:** Use the personal protective equipment (PPE) hazard assessment to determine the type of footwear and other PPE the employees need to wear. See WAC 296-800-160, PPE, in the safety and health core rules.

#### **You must:**

- (2) Mow across the face of a slope.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-16030, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-16035 Use ride-on mowers safely.**

#### **You must:**

- (1) Make sure not to carry passengers.
- (2) Make sure the operator looks down and behind before and while moving backwards.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-16035, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-170 Jacks. Summary.**

#### **IMPORTANT:**

This section applies to portable hand- or power-operated:

- Hydraulic jacks
- Mechanical ratchet jacks
- Mechanical screw jacks.

#### **Your responsibility:**

Make sure jacks are safe to use.

#### **You must:**

##### **LABELING**

#### **Make sure jacks are labeled with their rated load(s)**

WAC 296-807-17005

##### **BEFORE USE**

#### **Make sure the jack is safe to lift the load**

WAC 296-807-17010

##### **LIFTING THE LOAD**

#### **Lift the load safely**

WAC 296-807-17015

##### **INSPECTION AND MAINTENANCE**

#### **Visually inspect jacks and keep them in good working order**

WAC 296-807-17020.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-170, filed 4/4/03, effective 8/1/03.]

#### **WAC 296-807-17005 Make sure jacks are labeled with their rated load(s).**

##### **You must:**

- Make sure the rated load(s) of the jack is:
  - Readable
  - Durably marked in an easily seen location on the jack.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-17005, filed 4/4/03, effective 8/1/03.]

#### **WAC 296-807-17010 Make sure the jack is safe to lift the load.**

##### **You must:**

- (1) Visually examine the general condition of the jack before each use.

**Note:** If a jack is to be used more than once on a shift, the visual examination is only required before the jack is used for the first time that shift.

##### **You must:**

- (2) Make sure the weight to be lifted or supported is within the rated load of the jack.
- (3) Make sure the base of the jack is on a firm foundation or blocked before lifting the load.
- (4) Make sure hydraulic jacks exposed to freezing temperatures function properly at the temperature they will be used.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-17010, filed 4/4/03, effective 8/1/03.]

#### **WAC 296-807-17015 Lift the load safely.**

##### **You must:**

- (1) Place a block between the load cap and the load if the load could slip off the jack.
- (2) Secure the load from falling or slipping immediately after it is raised by one or more of the following:
  - Cribbing
  - Blocking
  - Some other equally effective method.
- (3) Make sure you do not exceed the limit of travel of the jack.

**Note:** The limit of travel can be determined by one or more of the following:
 

- A positive stop
- A stop indicator
- Some other equally effective method.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-17015, filed 4/4/03, effective 8/1/03.]

#### **WAC 296-807-17020 Visually inspect jacks and keep them in good working order.**

**Note:** There are two types of inspection, frequent or periodic, depending on how often they are done.

##### **You must:**

- (1) Inspect jacks at appropriate intervals:

- Make sure frequent inspections are done by the operator or other designated person as follows:
    - Before a jack is first placed in service.
    - Monthly for a jack used in normal service.
    - Daily or before each use for a jack used for other than normal service.
    - Before using a jack that has been altered, modified, or repaired.
    - Before using a jack that has not been used in one year or more.
  - Make sure a periodic inspection of the jack is done once a year.
  - Inspect the jack using Table 4, Jack Inspection Requirements, during any frequent or periodic inspection.
- (2) Make sure a jack that is out of order is:
- Tagged
  - Not used until repaired.
- (3) Make sure a jack is properly lubricated at regular intervals.

**Note:** The jack should be lubricated following the manufacturer's instructions.

**Table 4  
Jack Inspection Requirements**

Inspection Item	Frequent Inspection	Periodic Inspection
Check all of the following items that apply to the jack:		
Improper pawl engagement	X	X
Excessive pawl wear	X	X
Chipped, cracked, or worn rack teeth	X	X
Damaged, bent, or worn threads	X	X
Leaking hydraulic fluid	X	X
Scored or damaged plunger	X	X
Improper functioning	X	X
Free movement of swivel, heads, and caps	X	X
Loose bolts or rivets	X	X
Damaged or improperly assembled accessory equipment	X	X
Rack wear or bending	X	X
Other items as specified in the manufacturer's instructions	X	X
Watch the jack during operation	X	X
More detailed inspection required if a designated person determines any condition discovered is a hazard	X	
Clean and check internal parts for wear or damage if inspection indicates an internal problem		X

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-17020, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-180 Portable tools using abrasive wheels. Summary.**

**IMPORTANT:**

This section applies to portable tools using abrasive wheels.

**Definition:**

**Abrasive wheel.** A grinding tool consisting of bonded abrasive grains. This includes diamond and reinforced wheels.

**Exemption:** This section does not apply to machines using:

- Natural sandstone wheels
- Pulpstone wheels
- Coated abrasive products
- Loose abrasives.

**Your responsibility:**

Make sure abrasive wheel tools and wheels are safe to use.

**You must:**

**DESIGN AND CONSTRUCTION**

**Make sure abrasive wheels and tools are properly designed and constructed**

WAC 296-807-18005

**GUARDS**

**Make sure machines have safety guards**

WAC 296-807-18010

**Keep safety guards in good functional condition**

WAC 296-807-18015

**GUARDS - SPECIFIC WHEELS**

**Use specific safety guards for machines using Type 1 grinding wheels, cutting-off wheels, and tuck pointing wheels**

WAC 296-807-18020

**Use specific safety guards for vertical and angle grinders using Type 6 or Type 11 wheels**

WAC 296-807-18025

**Use specific safety guards for vertical and angle grinders using Type 27, 28 and 29 wheels**

WAC 296-807-18030

**SIDE HANDLES**

**Use side handles on vertical and angle grinders**

WAC 296-807-18035

**ABRASIVE WHEELS**

**Make sure abrasive wheels are safe to use**

WAC 296-807-18040

**MOUNTING**

**Mount wheels properly**

WAC 296-807-18045

**FLANGES**

**Use proper flanges**

WAC 296-807-18050

**Make sure flanges are in good condition**

WAC 296-807-18055

**FLANGES - SPECIFIC WHEELS**

**Use specific flanges for Type 1 cutting-off wheels**

WAC 296-807-18060

**Use specific flanges for Type 27A cutting-off wheels**

WAC 296-807-18065

**Use specific flanges for threaded hole wheels**

WAC 296-807-18070

**Use specific flanges for cup, cone or plug wheels with threaded inserts or projecting studs**

WAC 296-807-18075

**BLOTTERS****Use blotters when required**

WAC 296-807-18080

**BLOTTERS - TYPE 6 AND 11 WHEELS****Meet specific blotter requirements when using modified Types 6 and 11 wheels (terrazzo)**

WAC 296-807-18085.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-180, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18005 Make sure abrasive wheels and tools are properly designed and constructed.****You must:**

- Make sure abrasive wheels and tools meet the design and construction requirements of:

- American National Standards Institute (ANSI) B7.1-2000, Safety Requirements for the Use, Care and Protection of Abrasive Wheels

**OR**

- ANSI B186.1-1984, Safety Code for Portable Air Tools.

**Note:** Tools may have a statement on the tool or in the instruction manual that the tool meets the appropriate ANSI standard. If in doubt, check with the manufacturer.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18005, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18010 Make sure machines have safety guards.****You must:**

- Use abrasive wheels only on machines that have safety guards.

- Make sure the safety guard:

- Is mounted so it maintains proper alignment with the wheel

- Is mounted with fasteners strong enough to keep the guard in position if a wheel breaks

- Is positioned to deflect pieces of an accidentally broken wheel away from the operator

- Covers the spindle end, nut, and flange projections.

**Exemption:**

Safety guards are not required on machines that use:

- Wheels for internal grinding while advancing, retracting or within the work

- Mounted wheels two inches or less in diameter

- Types 16, 17, 18, 18R, and 19 cones and plugs and threaded hole pot balls where:

- The work offers protection

**OR**

- The size does not exceed three inches in diameter by five inches long.

- Notched, segmented, or continuous rim metal centered diamond lapidary wheels that are:

- Used with a coolant deflector

**AND**

- Operated at 3,500 SFPM or less.

- Type 1 wheels that are:

- Two inches or less in diameter

- One-half inch or less thick

- Operating at peripheral speeds less than 1,800 SFPM

- Mounted on mandrels and used in portable drills.

- Type 1 reinforced wheels that are:

- Three inches or less in diameter one-quarter inch or less thick

- Operating at peripheral speeds of 9,500 SFPM or less

- Used by operators wearing safety glasses and face shields.

- Valve seating grinding wheels.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18010, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18015 Keep safety guards in good functional condition.****You must:**

- Make sure safety guards are in good functional condition.

- Replace any safety guard that:

- Is damaged, bent or severely worn

**OR**

- Has been hit by parts from a breaking wheel.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18015, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18020 Use specific safety guards for machines using Type 1 grinding wheels, cutting-off wheels, and tuck pointing wheels.****You must:**

- Make sure the safety guard covers the top and sides of the wheel for at least one hundred eighty degrees.

**Note:** It is not required to cover the spindle end, nut and outer flange.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18020, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18025 Use specific safety guards for vertical and angle grinders using Type 6 or Type 11 wheels.****You must:**

- Make sure the safety guard:

- Covers the wheel's plane of rotation toward the operator for at least one hundred eighty degrees

- Covers the side of the wheel toward the driving flange for at least one hundred eighty degrees

- Has a skirt which is adjustable to within one-eighth inch of the plane of the surface of the wheel.

- Make sure not to use a "revolving cup guard."

**Note:** "Cup back bushings" do not substitute for safety guards.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18025, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18030 Use specific safety guards for vertical and angle grinders using Type 27, 28 and 29 wheels.****You must:**

- Make sure safety guards:

- Cover the wheel's plane of rotation toward the operator for at least one hundred eighty degrees

- Cover the side of the wheel toward the driving flange for at least one hundred eighty degrees
- Have a lip on the outer edge that:
  - Extends beyond the surface of the wheel throughout the one hundred eighty degree coverage

AND

- Curls inward to deflect wheel fragments.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18030, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18035 Use side handles on vertical and angle grinders.**

**You must:**

Use a side handle on all four-inch and larger vertical and angle grinders.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18035, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18040 Make sure abrasive wheels are safe to use.**

**You must:**

- Do the following before mounting a wheel:
  - Visually inspect the wheel for cracks or damage
  - Perform a ring test for cracks (size and shape of the wheel permitting)
  - Make sure the spindle speed of the machine is not greater than the operating speed of the wheel.
- Make sure a damaged or cracked wheel is not mounted or used.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18040, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18045 Mount wheels properly.**

**You must:**

- (1) Make sure wheels fit freely on the spindle, wheel sleeves, or adaptors, and remain free under all grinding conditions.
  - (2) Make sure wheel, blotter and flange surfaces that contact each other are flat and free of foreign particles.
  - (3) Make sure any reducing bushing used in the wheel hole:
    - Fits freely on the spindle and maintains proper clearance
    - Does not exceed the width of the wheel or contact the flanges.
  - (4) Make sure that multiple wheels mounted between a single set of flanges are either:
    - Cemented together
- OR
- Separated by spacers that have a diameter and bearing surface that is the same as the mounting flanges.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18045, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18050 Use proper flanges.**

**You must:**

- Mount all abrasive wheels between flanges that have a diameter at least one-third the diameter of the wheel.

**Exemption:**

- Mounted wheels

- Cup, cone or plug wheels with threaded inserts or projecting studs
- Abrasive disc wheels (inserted nut, inserted washer and projecting stud type)
  - Plate mounted wheels
  - Cylinder, cup, or segmental wheels mounted in chucks
  - Types 27, 28 and 29 wheels
  - Internal wheels less than two inches in diameter
  - Modified Type 6 and 11 wheels (terrazzo)
  - Types 1 and 27A cutting-off wheels.

**You must:**

- Make sure flanges are:
  - Dimensionally accurate
  - Properly balanced
  - Flat
  - Free of rough surfaces or sharp edges.
- Make sure, if a wheel is mounted between two flanges, that both flanges:
  - Are the same diameter
  - Have equal bearing surfaces.

**Exemption:**

The following wheels do not require same diameter, equal bearing surface flanges:

- Types 27, 28, and 29 wheels with adaptors
- Modified Types 6 and 11 wheels with tapered K dimension
- Internal wheels less than two inches in diameter.

**You must:**

- Make sure the driving flange is:
  - Part of the spindle

OR

- Securely fastened to the spindle.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18050, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18055 Make sure flanges are in good condition.**

**You must:**

- Make sure flange bearing surfaces are in good condition.
  - Replace or remachine any flange with a mounting surface that has any of the following problems:
    - Warped
    - Burred on the bearing surface
    - Excessively worn (thickness or diameter)
    - Out of true.

**Note:** Flanges that are refaced or trued need to satisfy minimum dimension requirements specified in ANSI B7.1-2000, Safety Requirements for the Use, Care and Protection of Abrasive Wheels.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18055, filed 4/4/03, effective 8/1/03.]

**WAC 296-807-18060 Use specific flanges for Type 1 cutting-off wheels.**

**You must:**

- Mount Type 1 cutting-off wheels between flanges that are:
  - Properly relieved with matching bearing surfaces
  - At least one-quarter the wheel diameter.

**Note:** American National Standards Institute (ANSI) B7.1-2000, Safety Requirements for the Use, Care and Protection of Abrasive Wheels, has specific exemptions for some reinforced, bonded abrasive cutting-off wheels and steel centered, diamond cutting-off wheels. These wheels are primarily used for masonry cutting and concrete sawing.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18060, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-18065 Use specific flanges for Type 27A cutting-off wheels.**

**You must:**

- Mount Type 27A cutting-off wheels between flanges that are:
  - Flat (unrelieved) with matching bearing surfaces
  - At least one-quarter the wheel diameter.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18065, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-18070 Use specific flanges for threaded hole wheels.**

**You must:**

- Use a back flange to mount threaded hole wheels that is:
  - Flat (unrelieved)
  - Securely fastened and square to the spindle axis
  - Able to properly support the wheel.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18070, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-18075 Use specific flanges for cup, cone or plug wheels with threaded inserts or projecting studs.**

**You must:**

- Mount cup, cone or plug wheels with threaded inserts or projecting studs against a straight, unrelieved flange.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18075, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-18080 Use blotters when required.**

**You must:**

- Use a blotter between each flange and the abrasive wheel surface to uniformly distribute flange pressure.
- Make sure the blotter covers the entire flange contact area.
- Use a new blotter each time a wheel is mounted unless the wheel has a blotter already attached to it by the manufacturer.
- Make sure scuffed or damaged blotters are not used.

**Exemption:**

You do not need to use a blotter with:

- Mounted wheels
- Abrasive disc and Type 2 wheels which are mounted by inserted nuts, inserted washers, or projecting studs
  - Plate mounted wheels
  - Wheels mounted in chucks (such as cylinders and segmental wheels)
    - Types 27, 28 and 29 wheels
    - Type 1 and Type 27A cutting-off wheels
    - Internal wheels less than two inches in diameter
    - Diamond and cubic boron nitride wheels with metal or carbon fiber cores.

[Title 296 WAC—p. 2822]

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18080, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-18085 Meet specific blotter requirements when using modified Types 6 and 11 wheels (terrazzo).**

**You must:**

- Mount modified Types 6 and 11 wheels (terrazzo) with a blotter applied to the flat side of the wheel only.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-18085, filed 4/4/03, effective 8/1/03.]

### **WAC 296-807-190 Definitions.**

**Abrasive wheel.** A grinding tool consisting of bonded abrasive grains. This includes diamond and reinforced wheels.

**Blind hole.** A hole drilled in an object, such as an abrasive wheel, that does not go all the way through.

**Blotter.** A compressible disc or washer, usually of blotting paper, plastic, cardboard, or gasket material, that is used between the wheel and the flanges to evenly distribute flange pressure on the wheel.

**Cone and plug wheels (Types 16, 17, 18, 18R, and 19).** Abrasive wheels manufactured with blind hole threaded bushings. They may be used on all surfaces except the flat mounting surface (D). Specific characteristics of the different cone and plug wheels are:

- Type 16 cones have a curved side with a nose radius
- Type 17 cones have straight sides with or without a nose radius
- Type 18 and 18R plug wheels are cylindrical in shape with either a square or curved grinding end
- Type 19 cone wheels are a combination of cone and plug shapes

**Cutting-off wheels.** Abrasive wheels used to cut material such as masonry, pipe, etc.

**Designated person.** A person selected or assigned by the employer or the employer's representative as competent to perform specific duties.

**Discharge opening.** An opening in a mower housing for discharging grass.

**Flanges.** Collars, discs or plates between or against which wheels are mounted. There are four types of flanges:

- Adaptor
- Sleeve
- Straight relieved
- Straight unrelieved.

**Grass catcher.** Parts or a combination of parts to collect grass clippings or debris.

**Guard (abrasive wheels).** An enclosure designed to restrain the pieces of an abrasive wheel and furnish protection to the operator if the wheel is broken during operation.

**Guard.** A part or assembly to prevent accidental contact with hazardous machine parts or to protect persons from other hazards created by the machinery.

**Inorganic bonded wheel.** Abrasive wheels that are bonded by means of inorganic material such as clay, glass, porcelain, sodium silicate, magnesium oxychloride, or metal.

**Jack.** A portable hand- or power-operated mechanism for lifting, lowering or moving horizontally a load by applying a pushing force.

**Modified Types 6 and 11 wheels (terrazzo).** Similar to Type 6 "straight cup" wheels and Type 11 "flaring cup" wheels except for the bottom of the cup. The bottom of the cup is flat in Type 6 and 11 wheels. The modified wheels have bottoms that are sloped downwards towards the mounting hole. These modified wheels need to be mounted using a special tapered flange furnished by the tool manufacturer. These wheels are used in the terrazzo trade.

**Mounted wheels.** Bonded abrasive wheels of various shapes, usually two inches diameter or smaller, that are secured to plain or threaded steel mandrels.

**Normal service (jacks).** Raising or lowering axial loads that are eighty-five percent or less of the rated load under controlled conditions.

**Organic bonded wheels.** Abrasive wheels that are bonded by means of organic material such as resin, rubber, shellac, or other similar bonding agent.

**Rated load.** The maximum load that the jack is designed to lift or support.

**Reinforced wheels.** Organic bonded abrasive wheels which have webbing, fabric or filament to provide resistance to complete breaking of the wheel should it become cracked or damaged.

**Terrazzo.** A material of stone chips, such as marble, set in mortar and polished.

**Threaded hole wheels.** Abrasive wheels that have one central threaded bushing, securely anchored in place. They are mounted by being screwed onto a threaded machine spindle so that the wheel back seats firmly against an unrelieved flat back flange.

**Tuck pointing wheels.** Tuck pointing abrasive wheels are Type 1 reinforced, organic bonded wheels and have diameter, thickness and hole size dimensions. They are used to remove cement, mortar, or other nonmetallic jointing material.

**Type 1 wheel.** An abrasive wheel shaped like a disc with a mounting hole in the middle. Sometimes called a "straight wheel." It has diameter (D), thickness (T), and hole size (H) dimensions. Grinding is normally done on the periphery (outside curve) of the wheel (T dimension). Can be used for grinding, cutting-off, and tuck pointing.

**Type 2 wheel.** An abrasive wheel shaped like an open-ended, hollow cylinder. Sometimes called a cylinder wheel. It has diameter (measured from the outer wall of the cylinder), wheel thickness (height of the cylinder), and rim thickness (thickness of the cylinder wall). Grinding is done on the end of the cylinder (rim thickness dimension).

**Type 6 wheel.** An abrasive wheel shaped like a straight-sided cup or bowl with a mounting hole in the bottom of the cup. Sometimes called a "cup wheel." It has diameter (D), thickness (T), hole size (H), rim thickness (W), and back thickness (E) dimensions. Grinding is normally done on the cup rim (W dimension).

**Type 11 wheel.** An abrasive wheel shaped like a cup or bowl with a mounting hole in the bottom of the cup. The sides of the cup are not straight-sided but are angled outward. Sometimes called a "flaring cup wheel" since the sides are "flared" out. It has double diameter dimensions (top D and bottom J). It also has thickness (T), hole size (H), rim thickness (W) and back thickness (E) dimensions. Grinding is normally done on the cup rim (W dimension).

**Type 16, 17, 18, 18R, and 19 wheels.** See cone and plug wheels.

**Type 27 wheel.** An abrasive wheel similar to a Type 1 wheel, but the center of the wheel around the mounting hole is pushed back (depressed). Sometimes called a "depressed center" wheel. It has diameter (D), thickness (U) and hole size (H) dimensions. The depressed center allows grinding on the flat surface of the wheel without interference from the flange or mounting hardware.

**Type 27A cutting-off wheel.** Similar to a Type 27 wheel. Specifically designed for use on cutting-off machines.

**Type 28 wheel.** An abrasive wheel similar to a Type 27 wheel, but the face of the wheel is angled upward and away from the mounting hole. The face of a Type 27 wheel is flat and perpendicular to the mounting hole. A Type 28 wheel is also called a "depressed center" wheel. It has diameter (D), thickness (U) and hole size (H) dimensions. The depressed center allows grinding without interference from the mounting. A Type 28 wheel has a saucer-shaped grinding rim and is designed for corner grinding and side grinding.

**Type 29 wheel.** An abrasive wheel that has reversed, saucer-shaped grinding rims (similar to a partially opened umbrella).

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 03-09-009, § 296-807-190, filed 4/4/03, effective 8/1/03.]

**Chapter 296-809 WAC  
 CONFINED SPACES**

**WAC**

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- 296-809-20004 Inform employees and control entry to permit-required confined spaces.
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- 296-809-600 Alternate entry procedures.
- 296-809-60002 Make sure the following conditions are met if using alternate entry procedures.
- 296-809-60004 Follow these alternate entry procedures for permit-required confined spaces.
- 296-809-700 Nonpermit confined spaces requirements.
- 296-809-70002 Follow these requirements when classifying a confined space as a nonpermit confined space.
- 296-809-70004 Reevaluate nonpermit confined spaces if hazards develop.
- 296-809-800 Definitions.

**WAC 296-809-100 Scope.** This chapter applies to all confined spaces and provides requirements to protect

employees from the hazards of entering and working in confined spaces. This chapter applies in any of the following circumstances:

- You have confined spaces in your workplace.
- Your employees will enter another employer's confined spaces.
- A contractor will enter your confined spaces.
- You provide confined space rescue services.

You can use Table 1 to help you decide which requirements to follow for confined spaces.

**Table 1**  
**Requirements for Confined Spaces**

For confined spaces that are	The requirements in the following sections apply					
	200	300	400	500	600	700
Permit-required confined spaces	X	X	X	X	X	X
Entered by a contractor	X	X	X	X	X	X
Nonpermit confined spaces	X					X
Never entered	X					
<b>If you only:</b>						
Use alternate entry procedures	X	X	X		X	
Have a contractor enter your space	X					
Are a rescue service provider		X	X	X		

**Definition:**

A **confined space** is a space that is ALL of the following:

- Large enough and arranged so an employee could fully enter the space and work.
- Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.
- Not primarily designed for human occupancy.

Rules in other chapters that cover confined spaces may also apply to your work. You can find a list of these rules in the resources section of this chapter.

- Note:**
- Requirements in other chapters may apply to your work. You will find some safety and health requirements are addressed on a broad level in this chapter, while being addressed for a specific application in another rule. When this happens, both requirements apply and should not conflict. When a conflict does occur, you need to follow the more specific requirement.
  - If you are uncertain which requirements to follow, contact your local labor and industries (L&I) office.
  - For a complete list of local L&I offices, see the resources section of the safety and health core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-100, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-200 Summary. Identifying and controlling permit-required confined spaces.**

**Your responsibility:**

To identify your permit-required confined spaces and control employee entry.

**You must:**

Identify permit-required confined spaces.

**WAC 296-809-20002**

Inform employees and control entry to permit-required confined spaces.

**WAC 296-809-20004**

Follow these requirements when you contract with another employer to enter your confined space.

**WAC 296-809-20006**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-200, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-20002 Identify permit-required confined spaces.**

**IMPORTANT:**

If your workplace contains only nonpermit confined spaces and your employees do not enter another employer's confined space, you may follow only the requirements in:

- WAC 296-809-200, Identifying and controlling permit-required confined spaces; and
- WAC 296-809-700, Nonpermit confined space requirements.

• See the resources section for other chapters covering confined spaces that may apply to your work.

**You must:**

• Identify all permit-required confined spaces in your workplace.

• Assume any confined space is a permit-required confined space, unless you determine the space to be a nonpermit confined space.

– If you enter the space to determine the hazards, follow the requirements in WAC 296-809-500, Permit entry procedures.

– If you evaluate the confined space and there are no potential or actual hazards, you can consider it to be a nonpermit confined space.

■ Document your determination that the space is nonpermit, as required by WAC 296-809-700.

**Definitions:**

A **permit-required confined space or permit space** is a confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

- Contains or has a potential to contain a hazardous atmosphere.
  - Contains a material with the potential for engulfing someone who enters the space.
  - Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross-section.
  - Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.
  - Contains any other recognized safety or health hazard that could either:
    - Impair the ability to self rescue;
- OR**
- Result in a situation that presents an immediate danger to life or health.

A **nonpermit confined space** is a confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-20002, filed 1/20/04, effective 5/1/04.]

### **WAC 296-809-20004 Inform employees and control entry to permit-required confined spaces.**

**You must:**

(1) Provide information about confined spaces as follows:

- Make available to affected employees and their authorized representatives all information and documents required by this chapter.
- Inform affected employees about the existence, location, and danger of any permit-required confined spaces in your workplace by:
  - Posting danger signs; or
  - Using any other equally effective means to inform employees.

**Note:** A sign reading "Danger-Permit Required Confined Space, DO NOT ENTER" or using pictures or other similar wording employees can understand would satisfy the requirement for a sign.

**You must:**

(2) Take effective measures to prevent unauthorized employees from entering permit-required confined spaces.

**Note:** Examples of measures to prevent employee entry include padlocks, bolted covers, special tools to remove covers, and providing employee training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-20004, filed 1/20/04, effective 5/1/04.]

### **WAC 296-809-20006 Follow these requirements when you contract with another employer to enter your confined space.**

**IMPORTANT:**

The contractor is responsible for following all confined space requirements in this chapter and in other rules that apply. For a list of other rules that may apply, see the resources section of this chapter.

(2007 Ed.)

**You must:**

• Do all of the following if you arrange to have another employer (contractor) perform work that involves entry into your permit-required confined space:

- Inform the contractor:
  - That the workplace contains permit-required confined spaces and entry is allowed only if the applicable requirements of this chapter are met.
  - Of the identified hazards and your experience with each permit-required confined space.
  - Of any precautions or procedures you require for the protection of employees in or near spaces where the contractor will be working.
- Coordinate entry operations with the contractor, when either employees or employers from the different companies will be working in or near permit-required confined spaces.
- Discuss entry operations with the contractor when they are complete. Include the following in your discussion:
  - The program followed during confined space entry; and
  - Any hazards confronted or created.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-20006, filed 1/20/04, effective 5/1/04.]

## **PERMIT-REQUIRED CONFINED SPACE PROGRAM**

**WAC 296-809-300 Summary.****Your responsibility:**

**To develop your permit-required confined space program and practices.**

**IMPORTANT:**

This section applies if employees will enter a permit-required confined space.

**You must:**

Develop a written permit-required confined space program.

**WAC 296-809-30002**

Meet these additional requirements if your employees enter another employer's confined space.

**WAC 296-809-30004**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-300, filed 1/20/04, effective 5/1/04.]

### **WAC 296-809-30002 Develop a written permit-required confined space program.**

**IMPORTANT:**

• Identify and evaluate the hazards of permit-required confined spaces and the work performed, to assist you in developing your entry program.

**You must:**

- Develop a written program, before employees enter, that describes the means, procedures, and practices you use for the safe entry of permit-required confined spaces as required by this chapter. Include the following when applicable to your confined space entry program:
  - Documentation of permit entry procedures.
  - Documentation used for alternate entry procedures.
  - How to reclassify permit-required confined spaces to nonpermit spaces.

[Title 296 WAC—p. 2825]

- Designation of employee roles, such as entrants, attendants, entry supervisors, rescuers, or those who test or monitor the atmosphere in a permit-required space.
- Identification of designated employee duties.
- Training employees on their designated roles.
- How to identify and evaluate hazards.
- Use and maintenance of equipment.
- How to prevent unauthorized entry.
- How to coordinate entry with another employer.
- How to rescue entrants.

**Note:** For alternate entry, your written program only needs to meet the requirements of WAC 296-809-400, Employee training, and WAC 296-809-600, Alternate entry procedures, of this chapter.

**You must:**

- Consult with affected employees and their authorized representatives when developing and implementing all aspects of your permit-required confined space program.
- Make the written program available to employees and their authorized representatives.
- Update your written program as necessary.

**Link:** You can find a sample permit-required confined space entry program in the user guide located in the resources section of this chapter or by visiting the labor and industries web site at <http://www.lni.wa.gov/wisha/publications/App>.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-30002, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-30004 Meet these additional requirements if your employees enter another employer's confined space.**

**You must:**

- Obtain any available information about permit-required confined space hazards and entry operations from the host employer.
- Coordinate entry operations with any other employers whose employees will be working in or near the permit-required confined space.
- Inform the host employer, either through a debriefing or during entry operations, about:
  - The entry program you will follow; and
  - Any hazards you confronted or created in the space during entry operations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-30004, filed 1/20/04, effective 5/1/04.]

**EMPLOYEE TRAINING**

**WAC 296-809-400 Summary.**

**Your responsibility:**

**To make sure employees are trained to perform their designated roles safely.**

**You must:**

Provide employee training.

**WAC 296-809-40002**

Certify employee proficiency.

**WAC 296-809-40004**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-400, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-40002 Provide employee training.**

**You must:**

- Provide training to each employee involved in permit-required confined space activities, so they acquire the understanding, knowledge and skills necessary to safely perform assigned duties.
- Establish employee proficiency in their confined space duties.
- Introduce new or revised procedures as necessary.

**Note:** Employers can determine employee proficiency by:

- Observing employee performance during training exercises that simulate actual confined space conditions.
- A comprehensive written examination; or
- Any other method that is effective for the employer.

**You must:**

- Provide training at the following times:
  - Before an employee is first assigned to duties covered by this chapter.
  - Before there is a change in an employee's assigned duties.
  - When there is a permit-required confined space hazard for which the employee has not already been trained.
  - If you have reason to believe that there are either:
    - Deviations from your procedures for permit-required confined space entry; or
    - Employee knowledge or use of your procedures is inadequate.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-40002, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-40004 Certify employee proficiency.**

**You must:**

- Certify employee proficiency in their assigned duties.
- Make sure the certification:
  - Contains each employee's name, the trainer's written or electronic signature or initials, and the dates of training.
  - Is available for inspection by employees and their authorized representatives.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-40004, filed 1/20/04, effective 5/1/04.]

**PERMIT ENTRY PROCEDURES**

**WAC 296-809-500 Summary.**

**Your responsibility:**

To establish procedures for the safe permit-required entry of confined spaces.  
Implement procedures for entry permits.

**WAC 296-809-50002**

Use an entry permit that contains all required information.

**WAC 296-809-50004**

Keep and review your entry permits.

**WAC 296-809-50006**

Prevent unauthorized entry.

**WAC 296-809-50008**

Provide, maintain, and use proper equipment.

**WAC 296-809-50010**

Evaluate and control hazards for safe entry.

**WAC 296-809-50012**

Make sure you have adequate rescue and emergency services available.

**WAC 296-809-50014**

Use nonentry rescue systems or methods whenever possible.

**WAC 296-809-50016**

Make sure entry supervisors perform their responsibilities and duties.

**WAC 296-800-50018**

Provide an attendant outside the permit-required confined space.

**WAC 296-809-50020**

Make sure entrants know the hazardous conditions and their duties.

**WAC 296-809-50022**

Implement procedures for ending entry.

**WAC 296-809-50024**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-500, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50002 Implement procedures for entry permits.**

**You must:**

- Identify and evaluate, before employees enter, potential hazards from:

- The permit-required confined space; and
- The work to be performed.

- Complete an entry permit before entry is authorized, documenting that you have completed the means, procedures and practices necessary for safe entry and work.

- Make sure that entrants or their representatives have an opportunity to observe any monitoring or testing, or any actions to eliminate or control hazards, performed to complete the permit.

- Identify the entry supervisor.

- Make sure the entry supervisor signs the entry permit, authorizing entry, before the space is entered.

- Make the completed permit available to entrants or their authorized representatives at the time of entry.

- Do this by either posting the completed permit at the entry location, or by any other equally effective means.

- Make sure the duration of the permit does not exceed the time required to complete the assigned task or job identified on the permit.

- Note any problems encountered during an entry operation on the permit. Use the information to make appropriate revisions to your program, entry operations, means, systems, procedures and practices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50002, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50004 Use an entry permit that contains all required information.**

**You must:**

- Make sure your entry permit identifies **all** of the following that apply to your entry operation:

- The space to be entered.
- Purpose of the entry.
- Date and the authorized duration of the entry permit.
- Hazards of the space to be entered.
- Acceptable entry conditions.
- Results of initial and periodic tests performed to evaluate and identify the hazards and conditions of the space,

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accompanied by the names or initials of the testers and by an indication of when the tests were performed.

- Appropriate measures used before entry to isolate the space, and eliminate or control hazards.

- Examples of appropriate measures include the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit-required confined spaces.

- Names of entrants and current attendants:

- Other means include the use of rosters or tracking systems as long as the attendant can determine quickly and accurately, for the duration of the permit, which entrants are inside the space.

- The current entry supervisor.

- A space for the signature or initials of the original supervisor authorizing entry.

- Communication procedures for entrants and attendants to maintain contact during the entry.

- Equipment provided for safe entry, such as:

- Personal protective equipment (PPE).

- Testing equipment.

- Communications equipment.

- Alarm systems.

- Rescue equipment.

- Rescue and emergency services available, and how to contact them. Include equipment to use, and names and contact information.

- Other information needed for safety in the particular confined space.

- Additional permits issued for work in the space, such as for hot work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50004, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50006 Keep and review your entry permits.**

**You must:**

- Keep entry permits for at least one year.

- Keep entry permits or other atmospheric monitoring records that show the actual atmosphere an employee entered or worked in, as employee exposure records.

- Review your permit-required confined space entry program as follows:

- Conduct a review when you have any reason to believe your entry program may not protect employees, and revise your program before allowing subsequent entries.

**Note:** Examples of circumstances requiring the review of your program include the following:

- There is unauthorized entry of a permit space.
- A permit space hazard not covered by the permit is found.
- A condition prohibited by the permit occurs.
- An injury or near-miss occurs during entry.
- There is a change in the use or configuration of a permit space.
- An employee complains about the effectiveness of the program.

**You must:**

- Review canceled entry permits within one year following each entry to evaluate:

- Your permit-required confined space program.

- The protection provided to employees entering permit-required confined spaces.

- Update your written permit-required confined space entry program as necessary.

**Note:** Employers may perform a single annual review covering all entries performed during a twelve-month period. If no entry is performed during a twelve-month period, no review is necessary.

**Reference:** Keep employee exposure records according to chapter 296-62 WAC, Part B, Access to records.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50006, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50008 Prevent unauthorized entry.**

**You must:**

- Implement measures necessary to prevent unauthorized entry into permit-required confined spaces, when conducting authorized entry.

**Note:**

- When removing entrance covers to open the confined space, protect entrants and those outside the confined space from hazards.
- Examples of measures to prevent unauthorized entry are signs, barricades, warning tape, and an attendant.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50008, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50010 Provide, maintain, and use proper equipment.**

**You must:**

- Provide the equipment in Table 2, when needed and at no cost to employees.
- Make sure that employees use provided equipment properly.
- Maintain the provided equipment.

**Table 2  
Equipment Provided to Employees at No Cost**

Type of equipment	For
Testing and monitoring equipment	Evaluating permit-required confined space conditions
Ventilating equipment	Obtaining and maintaining acceptable entry conditions
Communication equipment	Effective communication between the attendant and the entrants and to initiate rescue when required
Personal protective equipment (PPE)	Protecting employees from hazards of the space or the work performed
Lighting equipment	Employees to see well enough to work safely and to exit the space quickly in an emergency
Barriers or shields, such as pedestrian, vehicle or other barriers	Protecting employees from hazards outside of the space
Ladders	Safe entry and exit by entrants
Rescue and emergency equipment, except for equipment provided by the rescue service provider	Safe and effective rescue
Any other equipment	Safe entry into and rescue from permit-required confined spaces

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50010, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50012 Evaluate and control hazards for safe entry.**

- Evaluate and control hazards for safe entry into permit-required confined spaces by doing all the following:

- Test for atmospheric hazards, in this order:

- Oxygen.
- Combustible gases and vapors.
- Toxic gases and vapors.

- Provide each entrant or their authorized representative an opportunity to observe any of the following:

- Preentry testing.
- Subsequent testing.
- Monitoring of permit-required spaces.

- Reevaluate the permit-required space in the presence of any entrant, or their authorized representative, who requests this to be done because they have reason to believe that the evaluation of that space may not have been adequate.

- Upon request, immediately provide each entrant or their authorized representative, with the results of any testing required by this rule.

- Continuously monitor conditions in areas where entrants are working, when isolation of the space is not feasible.

- Examples would be a large space or space that is part of a continuous system, such as a sewer.

- Evaluate space conditions during entry as follows:

**Table 3  
Evaluating Space Conditions**

You must:	In order to
Test conditions before entry	Determine that acceptable entry conditions exist before entry is authorized by the entry supervisor
Test or evaluate space conditions during entry	Determine that acceptable entry conditions are being maintained during entry operations
Evaluate entry operations	Make sure entrants of more than one employer working at the same time in or around a permit-required confined space, do not endanger each other

**IMPORTANT:**

This section applies to both:

- Employers whose employees use permit entry procedures; and
- Employers who provide rescue services.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50012, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50014 Make sure you have adequate rescue and emergency services available.**

**You must:**

(1) Make sure you have adequate rescue and emergency services available during your permit-required confined space entry operations.

- Evaluate and select rescue teams or services who can:
  - Respond to a rescue call in a timely manner. Timeliness is based on the identified hazards. Rescuers must have the capability to reach potential victims within an appropriate time frame based on the identified permit space hazards.

– Proficiently rescue employees from a permit-required confined space in your workplace. Rescuers must have the appropriate equipment for the type of rescue.

- Make sure that at least one member of the rescue team or service holds a current certification in first aid and cardiopulmonary resuscitation (CPR).

- Inform each rescue team or service about the hazards they may confront when called to perform rescue.

- Provide the rescue team or service with access to all permit spaces from which rescue may be necessary.

– This will allow them to develop appropriate rescue plans and to practice rescue operations.

**Note:** What will be considered timely will vary according to the specific hazards involved in each entry. For example, chapter 296-842 WAC, Respirators, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) for work areas considered to contain an IDLH atmosphere.

**You must:**

(2) Provide employees, assigned to provide permit-required confined space rescue and emergency services, with:

- Personal protective equipment (PPE) needed for safe entry.

- Other equipment required to conduct rescues safely.

- Training so they are:

– Proficient in the use of the PPE and other equipment.

– Proficient as an entrant of permit-required confined spaces.

– Able to safely perform assigned rescue and emergency duties.

– Knowledgeable in basic first aid and cardiopulmonary resuscitation (CPR).

- Practice sessions for permit-required confined space rescues **at least** once every twelve months where dummies, manikins, or actual persons are removed from either:

– The actual permit spaces; or

– Representative permit spaces that simulate the opening size, configuration, and accessibility, of permit spaces where rescue will be performed.

(3) Establish procedures for:

- Contacting rescue and emergency services.

- Rescuing entrants from permit-required confined spaces.

- Providing necessary emergency services to rescued entrants.

- Preventing unauthorized persons from attempting a rescue.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50014, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50016 Use nonentry rescue systems or methods whenever possible.**

**You must:**

- Use nonentry retrieval systems or methods to rescue entrants in a permit-required confined space unless this:

– Would increase the overall risk of injury to entrants; or

– Would not contribute to the rescue of the entrant.

- Make sure each entrant uses a chest or full-body harness, with a retrieval line attached to the harness at one of the following locations:

- At the center of the employee's back, near shoulder level.

- Above the employee's head.

- At another point which presents a profile small enough for the successful removal of the employee.

- Attach the retrieval line to a mechanical device or fixed point outside the space, so rescue can begin as soon as necessary.

- Make sure a mechanical device is available to retrieve entrants from vertical spaces more than five feet (1.52 m) deep.

**Note:** When you can demonstrate that the use of a chest or full-body harness is not feasible or creates a greater hazard, then you may use wristlets or another method shown to be the safest and most effective alternative.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50016, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50018 Make sure entry supervisors perform their responsibilities and duties.**

**You must:**

- Make sure that an entry supervisor:

- Authorizes the entry into a permit-required confined space by signing the entry permit.

- Oversees entry operations.

- Knows about the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.

- Verifies and checks **all** of the following:

- The appropriate entries have been made on the permit.

- All tests specified by the permit have been conducted.

- All procedures and equipment specified by the permit are in place before approving the permit and allowing entry to the space.

- Terminates the entry and cancels the permit when:

- The assigned task or job has been completed.

- A condition in the space that is not covered by the entry permit is discovered.

- Verifies that rescue services are available and that there is a way to contact them.

- Removes unauthorized individuals who enter or attempt to enter the permit-required confined space during entry operations.

- Determines that entry operations remain consistent with the terms of the entry permit and acceptable entry conditions are maintained:

- Whenever responsibility for a permit-required space entry operation is transferred; and

- At regular intervals dictated by the hazards and operations performed within the space.

**Note:** • Make sure entry supervisors have the required knowledge and proficiency to perform the job duties and responsibilities required by this chapter.

- The entry supervisor may also perform other duties under this chapter, such as attendant or entrant, if they are trained and proficient in those duties.

- The responsibility of the entry supervisor may be passed from one supervisor to another during an entry operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50018, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50020 Provide an attendant outside the permit-required confined space.****IMPORTANT:**

- The number of attendants assigned should be tailored to the requirements of the space and the work performed.
- You need to assess if it is appropriate or possible to have multiple permit spaces monitored by a single attendant, or have an attendant stationed at a location outside each space. Video cameras and radios are examples of tools that may assist an attendant monitoring more than one space.
- Attendants may be stationed at any location outside the permit-required confined space if the duties described in this section can be effectively performed for each space that is monitored.

**You must:**

- Provide at least one attendant outside the permit-required confined space during entry operations.
- Make sure each permit-required confined space attendant:
  - Understands the hazards that may be faced during entry, including the mode, signs or symptoms, and results of exposure to the hazards.
  - Is aware of the behavioral effects of exposure to the hazard.
  - Continuously maintains an accurate count of entrants in the space.
  - Maintains an accurate record of who is in the permit-required confined space.
  - Communicates with entrants as necessary to monitor their status or alert them of the need to evacuate the space.
  - Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space.
  - Orders entrants to evacuate the space immediately if **any** of the following conditions occur:
    - A prohibited condition.
    - The behavioral effects of hazardous exposure in an entrant.
    - A situation outside the space that could endanger entrants.
    - The attendant cannot effectively and safely perform all the duties required in this chapter.
      - Takes the following actions when unauthorized persons approach or enter a space:
        - Warn unauthorized persons to stay away from the space.
        - Tells the unauthorized persons to exit immediately if they have entered the space.
        - Informs entrants and the entry supervisor if unauthorized persons have entered the space.
          - Performs nonentry rescues as specified by your rescue procedure.
          - Has the means to respond to an emergency affecting one or more of the permit spaces being monitored without preventing performance of the attendant's duties to the other spaces being monitored.
          - Carries out no duties that might interfere with their primary duty to monitor and protect the entrants.
          - Calls for rescue and other emergency services as soon as entrants may need assistance to escape from the space.
          - Monitors entry operations until relieved by another attendant or all entrants are out of the space.

[Title 296 WAC—p. 2830]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50020, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50022 Make sure entrants know the hazardous conditions and their duties.****You must:**

- Make sure that all entrants:
  - Know the hazards they may face during entry, including the mode, signs or symptoms, and results of exposure to the hazards.
  - Use equipment properly.
  - Communicate with the attendant as necessary so the attendant can:
    - Monitor entrant status.
    - Alert entrants of the need to evacuate.
  - Alert the attendant whenever either of these situations exist:
    - A warning sign or symptom of exposure to a dangerous situation such as, behavioral changes, euphoria, giddiness potentially from lack of oxygen or exposure to solvents.
    - A prohibited condition.
      - Exit from the permit-required confined space as quickly as possible when one of the following occurs:
        - The attendant or entry supervisor gives an order to evacuate.
        - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
        - The entrant detects a prohibited condition.
        - An evacuation alarm is activated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50022, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-50024 Implement procedures for ending entry.****You must:**

- Make sure you terminate the entry when entry operations are completed, including securing an entrance cover and canceling the permit.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-50024, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-600 Alternate entry procedures.****Summary:****Your responsibility:****To choose alternate entry procedures for spaces where the only hazard is a hazardous atmosphere.****IMPORTANT:**

In addition to this section, you also need to meet the requirements in the following sections of this chapter:

- WAC 296-809-200, Identifying and controlling permit-required confined spaces.
- WAC 296-809-300, Permit-required confined space program.
- WAC 296-809-400, Employee training.

**You must:**

Make sure the following conditions are met if using alternate entry procedures.

**WAC 296-809-60002**

Follow these alternate entry procedures for permit-required confined spaces.

**WAC 296-809-60004**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-600, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-60002 Make sure the following conditions are met if using alternate entry procedures.**

**You must:**

- Make sure, when using alternate entry procedures, instead of permit entry procedures, that you have monitoring and inspection data that supports the following:
  - That the only hazard of the permit-required confined space is an actual or potentially hazardous atmosphere.
  - That continuous forced air ventilation alone is all that is needed to maintain the permit-required confined space for safe entry.
- Make sure an entry to obtain monitoring and inspection data or to eliminate hazards is performed according to WAC 296-809-500, Permit entry procedures.
- Make sure all documentation produced is available to each affected employee and their authorized representative.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-60002, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-60004 Follow these alternate entry procedures for permit-required confined spaces.**

**You must:**

- Use the following alternate entry procedures:
  - Eliminate any unsafe conditions before removing an entrance cover.
    - When entrance covers are removed, promptly guard the opening with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening and protect entrants from objects falling into the space.
    - Certify that preentry measures have been taken (such as safe removal of the cover and having protection needed to gather preentry data), with the date, location of the space, and signature of the person certifying.
    - Make the preentry certification available before entry to each entrant.
      - Before an employee enters the confined space, test the internal atmosphere with a calibrated, direct-reading instrument for all of the following, in this order:
        - Oxygen content.
        - Flammable gases and vapors.
        - Potential toxic air contaminants.
      - Provide entrants, or their authorized representatives, with an opportunity to observe the preentry and periodic testing.
      - Make sure the atmosphere within the space is not hazardous when entrants are present.
      - Use continuous forced air ventilation, as follows:
        - Wait until the forced air ventilation has removed any hazardous atmosphere before allowing entrants into the space.
        - Direct forced air ventilation toward the immediate areas where employees are, or will be, and continue ventilation until all employees have left the space.
        - Provide the air supply from a clean source and make sure it does not increase hazards in the space.
          - Test the atmosphere within the space as needed to make sure hazards do not accumulate.

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– If a hazardous atmosphere is detected during entry, do all of the following:

- Evacuate employees from the space immediately.
- Evaluate the space to determine how the hazardous atmosphere developed.
- Implement measures to protect employees from the hazardous atmosphere before continuing the entry operation.
- Verify the space is safe for entry before continuing the entry operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-60004, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-700 Nonpermit confined spaces requirements.**

**Summary:**

**Your responsibility:**

To make sure any space you classify as nonpermit, does not have the potential to contain serious health or safety hazards.

**You must:**

Follow these requirements when classifying a confined space as a nonpermit confined space.

**WAC 296-809-70002**

Reevaluate nonpermit confined spaces if hazards develop.

**WAC 296-809-70004**

**IMPORTANT:**

A confined space may be classified as a nonpermit confined space for as long as the hazards remain eliminated. Once a hazard is present, you must follow all requirements of this chapter that apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-700, filed 1/20/04, effective 5/1/04.]

**WAC 296-809-70002 Follow these requirements when classifying a confined space as a nonpermit confined space.**

**You must:**

- Make sure the confined space meets these conditions to be classified as nonpermit confined spaces:
  - The confined space does not contain an actual or potential hazardous atmosphere.
  - The confined space does not contain hazards capable of causing death or serious physical harm. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.
    - If you must enter to remove hazards, the space must be treated as a permit-required confined space until hazards have been eliminated.

**Note:**

- Controlling atmospheric hazards through forced air ventilation does not eliminate the hazards.
- You should evaluate the use of lockout-tagout, as covered in WAC 296-24-110, to determine if using it fully eliminates the hazard.
- You are allowed to use alternate entry procedures covered in WAC 296-809-600, if you can demonstrate that forced air ventilation alone will control all hazards in the space.

**You must:**

- Document how you determined the confined space contained no permit-required confined space hazards. Certify this documentation with the following:
  - Date.

- Location of the space.
- Signature of the person making the determination.
- Make the certification available to each entrant, or their authorized representative.

**Note:** This certification must be completed every time a permit-required confined space is reclassified as a nonpermit space.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-70002, filed 1/20/04, effective 5/1/04.]

### **WAC 296-809-70004 Reevaluate nonpermit confined spaces if hazards develop.**

#### **You must:**

- Reclassify a nonpermit confined space to a permit-required confined space, if necessary, when changes in the use or configuration of the space increase the hazards to entrants.
- Make sure all employees exit the space if hazards develop. You must then reevaluate the space and determine whether it must be reclassified as a permit-required confined space.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-70004, filed 1/20/04, effective 5/1/04.]

### **WAC 296-809-800 Definitions.**

#### **Acceptable entry conditions:**

The conditions that must exist in a permit-required confined space to allow safe entry and work.

#### **Attendant:**

An individual stationed outside one or more permit-required confined spaces to monitor the entrants.

#### **Blanking or blinding:**

The absolute closure of a pipe, line, or duct by fastening a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore. It is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

#### **Confined space:**

A space that is **all** of the following:

- Large enough and arranged so an employee could fully enter the space and work.
- Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.
- Not primarily designed for human occupancy.

#### **Double block and bleed:**

The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

#### **Emergency:**

Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit-required confined space that could endanger authorized entrants.

#### **Engulfment:**

The surrounding capture of a person by a liquid or finely divided (flowable) solid substance that can be inhaled to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

[Title 296 WAC—p. 2832]

#### **Enter (entry):**

The action by which a person passes through an opening into a permit-required confined space and includes work activities in that space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

**Note:** If the opening is large enough for the worker to fully enter the space, a permit is required even for partial body entry. Permits are not required for partial body entry where the opening is not large enough for full entry, although other rules such as lockout-tagout, WAC 296-24-110 or respiratory hazards, chapter 296-841 WAC may apply.

#### **Entrant:**

An employee who is authorized by the employer to enter a permit-required confined space.

#### **Entry permit (permit):**

The written or printed document that is provided by you to allow and control entry into a permit-required confined space and that contains the information required in WAC 296-809-500, Permit entry procedures.

#### **Entry supervisor:**

The person (such as the employer, crew leader, or crew chief) responsible for:

- Determining if acceptable entry conditions are present at a permit-required confined space where entry is planned;
- Authorizing entry and overseeing entry operations; and
- Terminating entry as required.

#### **Hazardous atmosphere:**

An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit-required confined space), injury, or acute illness caused by one or more of the following:

- Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL).
- Airborne combustible dust at a concentration that meets or exceeds its LFL.

**Note:** This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52 m) or less.

– Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.

– Atmospheric concentration of any substance which may exceed a permissible exposure limit. For additional information about atmospheric concentration, see chapter 296-62 WAC, Parts F, G, and I, General occupational health standards and chapter 296-841 WAC, Respiratory hazards.

**Note:** An airborne concentration of a substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this definition.

– Any other atmospheric condition that is immediately dangerous to life or health.

**Note:** You can find guidance on establishing acceptable atmospheric conditions for air contaminants, which have no WISHA-determined doses or permissible exposure limits using other sources of information, such as:

- Material safety data sheets required by WAC 296-800-170, Employer chemical hazard communication.
- Published information.
- Internal documents.

#### **Hot work permit:**

A written authorization to perform operations, for example, riveting, welding, cutting, burning, and heating, that can provide a source of ignition.

**Immediately dangerous to life or health (IDLH):**

Any of the following conditions:

- An immediate or delayed threat to life.
- Anything that would cause irreversible adverse health effects.
- Anything that would interfere with an individual's ability to escape unaided from a permit-required confined space.

**Note:** Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse twelve to seventy-two hours after exposure. The victim "feels normal" after recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health (IDLH).

**Inerting:**

The displacement of the atmosphere in a permit-required confined space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

**Note:** This procedure produces an IDLH oxygen-deficient atmosphere.

**Isolation:**

The process by which a permit-required confined space is removed from service and completely protected against the release of energy and material into the space by such means as: Blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

**Line breaking:**

The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

**Nonpermit confined space:**

A confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

**Oxygen deficient atmosphere:**

An atmosphere containing less than 19.5 percent oxygen by volume.

**Oxygen enriched atmosphere:**

An atmosphere containing more than 23.5 percent oxygen by volume.

**Permit-required confined space or permit space:**

A confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material with the potential for engulfing someone who enters.
- Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross section.
- Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.
- Contains any other recognized serious safety or health hazard that could either:

- Impair the ability to self-rescue; or
- Result in a situation that presents an immediate danger to life or health.

**Permit-required confined space program:**

An overall program for:

- Controlling and appropriately protecting employees from permit-required confined space hazards; and
- Regulating employee entry into permit-required confined spaces.

**Prohibited condition:**

Any condition in a permit-required confined space that is not allowed by the permit during the authorized entry period.

**Rescue service:**

The personnel designated to rescue employees from permit-required confined spaces.

**Retrieval system:**

The equipment used for nonentry rescue of persons from permit-required confined spaces, such as a retrieval line, full-body harness or wristlets, and a lifting device or anchor.

**Testing:**

The process of identifying and evaluating the hazards that entrants may be exposed to in a permit-required confined space. Testing includes specifying the tests that are to be performed in the permit-required confined space.

**Note:** Testing allows employers to devise and implement adequate controls to protect entrants during entry, and to determine if acceptable entry conditions are present.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-03-081, § 296-809-800, filed 1/20/04, effective 5/1/04.]

## Chapter 296-811 WAC FIRE BRIGADES

**WAC**

296-811-100	Scope.
296-811-200	Establishing a fire brigade—Section contents.
296-811-20005	Organizing statement.
296-811-20010	Physical capability of brigade members.
296-811-300	Training—Section contents.
296-811-30005	Special hazards.
296-811-30010	Fire fighting training.
296-811-400	Equipment—Section contents.
296-811-40005	Fire fighting equipment.
296-811-40010	Protective clothing.
296-811-40015	Self-contained breathing apparatus' (SCBAs).
296-811-500	Requirements during fire fighting—Section contents.
296-811-50005	Brigade members in interior structural fires.
296-811-600	Definitions.

**WAC 296-811-100 Scope.** This chapter applies if you choose to establish a fire brigade.

**Definition:**

A fire brigade is an organized group of employees whose primary employment is other than fire fighting but who are knowledgeable, trained, and skilled in specialized fire fighting operations based on site-specific hazards present at a single commercial facility or facilities under the same management.

**Note:** Nothing in this chapter requires you to establish an employee fire brigade.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-100, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-200 Establishing a fire brigade—Section contents.**

**Your responsibility:**

To decide on brigade functions in the workplace and make sure brigade members are capable of doing them.

Organizing statement

WAC 296-811-20005.

Physical capability of brigade members

WAC 296-811-20010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-200, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-20005 Organizing statement.**

**You must:**

• Develop a written fire brigade policy that is available for inspection by employees or their designated representatives, that covers all of the following:

- The role and responsibilities of the fire brigade in the workplace.
- The basic organizational structure of the fire brigade.
- The number of brigade members.
- Type, amount, and frequency of training for brigade members according to the section Fire fighting training, WAC 296-811-30010, in this chapter.

**Note:** You may also want to include:  
• Descriptions of brigade member duties.  
• Line authority of each brigade officer.  
• Number of brigade officers.  
• Number of training instructors.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-20005, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-20010 Physical capability of brigade members.**

**You must:**

• Make sure brigade members who are assigned to fight interior structural fires are physically capable of doing this activity.

– Do not permit employees with known physical limitations that can be reasonably identified, such as heart disease or seizure disorder, to participate in structural fire fighting activities unless the employee has been released by a physician to do so.

**Note:** Not all brigade members need to be physically capable of fighting interior structural fires. Brigade members who are not physically capable of fighting interior structural fires may be assigned to other brigade duties that match their physical capabilities, such as pump operation or fire prevention inspection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-20010, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-300 Training—Section contents.**

**Your responsibility:**

To inform brigade members of special hazards in the workplace and train them for their brigade functions.

Special hazards

WAC 296-811-30005.

Fire fighting training

WAC 296-811-30010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-300, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-30005 Special hazards.**

**You must:**

• Develop, include in training, and make available to brigade members, written procedures that describe the following:

- The special hazards they may encounter in their workplace.
- The actions they need to take in situations that involve these hazards.

• Inform brigade members of any changes to those hazards, or the actions to take, when changes happen.

– Examples of special hazards include storing and using flammable liquids and gases, toxic chemicals, and radioactive substances.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-30005, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-30010 Fire fighting training.**

**You must:**

• Make sure training that a brigade member receives elsewhere that meets one or more requirements in Table 1, Training for brigade members, has been:

- Received within the past year;
- Documented as having been received, such as with a completion certificate.

• Provide training frequently enough to keep brigade members able to do their functions satisfactorily and safely.

**Note:** You may choose to train more often, monthly or even weekly, for some equipment or techniques. Consult fire training resources, such as the International Fire Service Training Association, the National Fire Protection Association (NFPA), or the International Society of Fire Service Instructors, for recommendations about fire training schools or programs.

**You must:**

• Make sure brigade members are trained according to Table 1, Training for Brigade Members.

**Table 1: Training for Brigade Members**

For these brigade members	Provide training that is	At these times
All brigade members, including leaders, trainers, and incident commanders.	<ul style="list-style-type: none"> <li>• Appropriate to their assigned duties and functions.</li> <li>• Appropriate to special hazards in the workplace.</li> <li>• Similar to that of reputable fire training schools.</li> <li>• A combination of hands-on and classroom experiences.</li> <li>• Suited to the industry you are part of, such as oil refining or chemical processing.</li> </ul>	<ul style="list-style-type: none"> <li>• Initially before they do any fire brigade emergency activities;</li> </ul> <p style="text-align: center;"><b>AND</b></p> <ul style="list-style-type: none"> <li>• Every year after initial training.</li> </ul>
Brigade members assigned to do interior structural fire fighting.	<p>All of the above <b>plus</b> the following:</p> <ul style="list-style-type: none"> <li>• Specific training in interior structural fire fighting.</li> </ul>	<p>At the above times <b>plus</b> the following:</p> <ul style="list-style-type: none"> <li>• Every quarter.</li> </ul>

For these brigade members	Provide training that is	At these times
Brigade members assigned as leaders, training instructors, or both.	All of the above <b>plus</b> the following: <ul style="list-style-type: none"> <li>• Additional training that is more comprehensive than that of other brigade members and appropriate to their assigned duties and functions.</li> </ul>	As needed to maintain their expertise at a higher level than that of other brigade members.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-30010, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-400 Equipment—Section contents.**

**Your responsibility:**

To provide brigade members with equipment and protective clothing appropriate for their brigade functions.

Fire fighting equipment

WAC 296-811-40005.

Protective clothing

WAC 296-811-40010.

Respiratory protective devices

WAC 296-811-40015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-400, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-40005 Fire fighting equipment.**

**You must:**

- Provide appropriate fire fighting equipment for the fire brigade.
- Inspect and maintain brigade fire fighting equipment according to Table 2, Fire Brigade Equipment Inspection and Maintenance.

**Table 2: Fire Brigade Equipment Inspection and Maintenance**

For this equipment	Do the following
All brigade fire fighting equipment.	<ul style="list-style-type: none"> <li>• Inspect at least every year.</li> <li>• Maintain in safe operating condition.</li> <li>• Replace if damaged or in unsafe condition.</li> </ul>
Brigade respirators and portable fire extinguishers.	Inspect at least every month and after each use.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-40005, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-40010 Protective clothing.**

**You must:**

- Provide appropriate protective clothing for fire brigade members who do interior structural fire fighting. Make sure protective clothing is:
  - Provided at no cost.
  - Meets the requirements for foot, body, hand, eye, face, and head protection found in another chapter, Safety standards for fire fighters, chapter 296-305 WAC.

**Exemption:**

- Protective clothing requirements do not apply to the following fire brigade members:
  - Those who don't perform interior structural fire fighting.

– Those who use only standpipe systems or portable fire extinguishers to control or put out fires that are in the incipient stage only.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-40010, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-40015 Self-contained breathing apparatus' (SCBAs).**

**You must:**

- Provide SCBAs, other than escape self-contained breathing apparatus' (ESCBAs), and make sure they are used by fire brigade members who do interior structural fire fighting.
  - Make sure SCBAs do the following:
    - Meet the requirements found in another chapter, Respirators, chapter 296-842 WAC.
    - Are positive-pressure or pressure-demand type.
    - Use only compressed-air cylinders that:
      - Meet department of transportation (DOT) and the National Institute for Occupational Safety and Health (NIOSH) requirements.
        - Have a service life of at least thirty minutes, as required by 42 CFR, Part 84.
        - Have an automatic alarm that can be heard when seventy-five to eighty percent of its service life has been used up.

**Note:**

- An SCBA can have a quick-disconnect valve or "buddy breathing" accessory **only if** the valve or accessory **does not** do any of the following:
  - Damage the SCBA.
  - Restrict the SCBA's air flow.
  - Interfere with the SCBA's normal operation.
  - The "buddy breathing" accessory or quick-disconnect valve need not be certified by NIOSH.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-40015, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-500 Requirements during fire fighting—Section contents.**

**Your responsibility:**

To make sure brigade members use safe practices during interior structural fire fighting.

Brigade members in interior structural fires

WAC 296-811-50005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-500, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-50005 Brigade members in interior structural fires.**

**IMPORTANT:**

Nothing in this section is meant to prevent fire brigade members assigned to respond to fires from rescue activities in an immediately dangerous to life and health (IDLH) atmosphere before the whole team assigned to respond to fires has arrived.

**You must:**

- Make sure at least two qualified fire brigade members go together into an IDLH atmosphere and remain in visual or voice contact with each other at all times.
  - Maintain standby assistance, with two people, as required by another section, Standby requirements for immediately dangerous to life or health (IDLH) conditions, WAC 296-842-19005.

- Note:** One of the two brigade members providing standby assistance can be assigned another role, such as safety officer, as long as the safety or health of any fire fighter working the incident will not be jeopardized if the brigade member becomes unavailable through giving assistance or rescue.
- Reference:** More information on interior structural fires is located in another section, WAC 296-305-05001, Emergency fire-ground operations—Structural.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-50005, filed 12/20/05, effective 3/1/06.]

**WAC 296-811-600 Definitions.**

**Buddy-breathing device**

An equipment accessory for self-contained breathing apparatus (SCBA) that permits a second person (a "buddy") to share the air supply used by the SCBA wearer.

**Extinguisher classification**

The letter classification given an extinguisher to designate the class or classes of fires on which that extinguisher will be effective. For example, use a Class A extinguisher on a Class A fire. See also fire classifications.

Portable fire extinguishers are classified for use on certain classes of fires and are rated within that class for relative extinguishing effectiveness at a temperature of plus 70°F by nationally recognized testing laboratories. This is based upon fire classifications and fire extinguishment potentials as determined by fire tests.

**Note:** The classification and rating system described in this section is used by Underwriters' Laboratories, Inc., and Underwriters' Laboratories of Canada, and is based on extinguishing preplanned fires of determined size and description as follows:

Extinguisher Class	Fire Test for Classification and Rating
Class A	Wood and excelsior fires excluding deep-seated conditions.
Class B	Two-inch depth gasoline fires in square pans.
Class C	No fire test. Agent must be a nonconductor of electricity.
Class D	Special tests on specific combustible metal fires.

**Extinguisher rating (see also "extinguisher classification")**

The numerical rating, such as 2A, given to an extinguisher that indicates the extinguishing potential of the unit based on standardized tests developed by Underwriters' Laboratories, Inc.

**Fire brigade**

An organized group of employees whose primary employment is other than fire fighting but who are knowledgeable, trained, and skilled in specialized fire fighting operations based on site-specific hazards present at a single commercial facility or facilities under the same management.

**Fire classifications**

Fires are classified based on the types of burning materials:

Fire Class	Types of Burning Materials
Class A	Fires involving ordinary combustible materials such as paper, wood, cloth, and some rubber and plastic materials.

Fire Class	Types of Burning Materials
Class B	Fires involving flammable or combustible liquids, flammable gases, greases, and similar materials, and some rubber and plastic materials.
Class C	Fires involving energized (live) electrical equipment where it is important that the extinguishing agent not conduct electricity. (When electrical equipment is de-energized, it is safe to use an extinguisher for Class A or B fires on it, since electricity is not an issue then.)
Class D	Fire involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium, and potassium.

**Incipient fire stage**

A fire in the beginning stage that can be controlled or put out by portable fire extinguishers, or small hose systems, without the need for protective clothing or breathing apparatus.

**Inspection**

A visual check of fire protection systems and equipment to ensure they are in place, charged, and ready for use if there is a fire.

**Interior structural fire fighting**

The physical activity of suppressing fire, rescuing people, or both, inside buildings or enclosed structures involved in a fire that is past the incipient stage.

**Maintenance**

Servicing fire protection equipment and systems to ensure they will perform as expected if there is a fire. Maintenance differs from inspection in that maintenance requires checking internal fittings, devices, and agent supplies, as well as correcting deficiencies found.

**Self-contained breathing apparatus (SCBA)**

Self-contained breathing apparatus (SCBA) in which the air pressure in the breathing zone is higher than that of the immediate environment during both inhaling and exhaling.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-01-073, § 296-811-600, filed 12/20/05, effective 3/1/06.]

**Chapter 296-816 WAC  
PROTECTING TRADE SECRETS**

**WAC**

296-816-100	Scope.
296-816-200	Protecting trade secrets.
296-816-20005	Indicate when trade secret information has been withheld.
296-816-20010	Provide trade secret information in a medical emergency.
296-816-20015	Respond to requests for trade secret information in non-emergency situations.
296-816-20020	Provide trade secret information when requested by WISHA.
296-816-300	Definitions.

**WAC 296-816-100 Scope.** This chapter applies to both:

- Withholding trade secret information from material safety data sheets (MSDSs) and employee exposure records; AND
- Providing trade secret information in medical emergencies and nonemergency situations.

**Definition:**

**Trade secrets:** Any confidential information that is used in an employer's business and gives an opportunity to gain an advantage over competitors who do not know or use it. It can be a:

- Formula.
- Pattern.
- Process.
- Device.
- Information.
- Collection of information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-026, § 296-816-100, filed 6/29/04, effective 9/1/04.]

**WAC 296-816-200 Protecting trade secrets.****Your responsibility:**

To meet requirements that apply to your workplace when withholding or providing trade secret information.

**You must:**

WAC 296-816-20005

Indicate when trade secret information has been withheld.

WAC 296-816-20010

Provide trade secret information in a medical emergency.

WAC 296-816-20015

Provide trade secret information in nonemergency situations.

WAC 296-816-20020

Provide trade secret information when requested by WISHA.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-026, § 296-816-200, filed 6/29/04, effective 9/1/04.]

**WAC 296-816-20005 Indicate when trade secret information has been withheld.****You must:**

• Indicate clearly in the MSDS or employee exposure records that trade secret information has been withheld.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-026, § 296-816-20005, filed 6/29/04, effective 9/1/04.]

**WAC 296-816-20010 Provide trade secret information in a medical emergency.****You must:**

• Immediately provide the specific chemical identity to the treating physician or nurse when **they determine:**

– That a medical emergency exists;

**AND**

– The specific chemical identity is necessary to treat the employee involved in the medical emergency.

**Note:**

- You may require a written statement of need and confidentiality agreement from the treating physician or nurse receiving the trade secret information as soon as circumstances of the medical emergency permit.
- If the health care professional receiving the trade secret information decides that there is a need to disclose it to WISHA, they need to inform you prior to, or at the same time as, disclosure being made to WISHA.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-026, § 296-816-20010, filed 6/29/04, effective 9/1/04.]

(2007 Ed.)

**WAC 296-816-20015 Respond to requests for trade secret information in nonemergency situations.****You must:**

• Provide specific chemical identity information in non-emergency situations when a written request by a health professional, employee, or designated representative, includes the following:

– Details showing that the specific chemical identity is needed for one or more of the following occupational health reasons:

■ Assessing the hazards of the chemicals employees will be exposed to.

■ Conducting or assessing sampling of the workplace atmosphere to determine employee exposure levels.

■ Conducting medical surveillance of exposed employees.

■ Providing medical treatment to exposed employees.

■ Selecting or assessing personal protective equipment for exposed employees.

■ Designing or assessing engineering controls or other protective measures.

■ Conducting studies to determine the health effects of exposure.

– Details showing why the following alternative information **does not** meet the needs of the requestor:

■ The properties and effects of the chemical.

■ Measures for controlling employees' exposure to the chemical.

■ Methods of monitoring and analyzing employee exposure to the chemical.

■ Methods of diagnosing and treating harmful exposures to the chemical.

– The procedures that will be used to keep the information confidential.

– A written confidentiality agreement that says:

■ The information will not be used for anything other than the stated health needs.

■ The information will not be released to anyone else, except according to the terms of the agreement or to WISHA.

**Note:**

- If the health care professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to WISHA, they need to inform you prior to, or at the same time as, disclosure being made to WISHA.

**You must:**

• Meet all the following requirements if you decide not to provide the requested trade secret information:

– Provide a written denial within thirty days that includes the following information:

■ The reasons for denying the request.

■ Evidence that the requested information is a trade secret.

■ A detailed explanation of how alternative information may satisfy the requesting party's needs without revealing any specific chemical identity.

– Provide alternative information that allows the requesting party to identify where and when an exposure occurred, if trade secret information was deleted.

– Make available all other information about the properties and effects of the specific chemical.

**Note:**

- If you deny a request for trade secret information, the requestor may refer the written denial, along with the origi-

nal request, to WISHA for consideration. WISHA will review the denial and determine if it meets the requirements of this chapter, such as whether:

- It is a bona fide trade secret.
- There is a medical or occupational health need for the information.
- Adequate means are in place to protect the confidentiality of the information.
- WISHA may issue orders or impose additional limitations or conditions on the release of the information to make sure that the occupational health needs are met without risk to you when you show WISHA that a confidentiality agreement will not provide enough protection against harm that could be caused to your business by disclosing a specific chemical identity.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-026, § 296-816-20015, filed 6/29/04, effective 9/1/04.]

### **WAC 296-816-20020 Provide trade secret information when requested by WISHA.**

#### **You must:**

- Provide trade secret information to WISHA when requested.
  - Make any trade secret claim, including supporting documentation, by the time you provide WISHA with the information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-026, § 296-816-20020, filed 6/29/04, effective 9/1/04.]

### **WAC 296-816-300 Definitions.**

#### **Designated representative:**

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written employee authorization.
- The legal representative of a deceased or legally incapacitated employee.

#### **Employee exposure record:**

A record containing any of the following information:

- Environmental (workplace) monitoring or measuring of a toxic substance or harmful physical agent, including personal, area, grab, wipe, or other form of sampling, as well as related collection and analytical methodologies, calculations, and other background data relevant to interpretation of the results obtained.
- Biological monitoring results which directly assess the absorption of a toxic substance or harmful physical agent by body systems, such as the level of a chemical in the blood, urine, breath, hair, or fingernails, but not including results which assess the biological effect of a substance or agent or which assess an employee's use of alcohol or drugs.
- Material safety data sheets (MSDSs) indicating that the material may pose a hazard to human health;

#### **OR**

- In the absence of the above:
  - A chemical inventory or any other record that reveals where and when used and the identity (e.g., chemical, common or trade name) of a toxic substance or harmful physical agent.
  - Exposure records of other employees with past or present job duties or related working conditions.

#### **Exposure or exposed:**

The contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition. Expo-

sure can occur through various routes, such as inhalation, ingestion, skin contact, or skin absorption.

#### **Health professional:**

A physician, occupational health nurse, industrial hygienist, toxicologist, or epidemiologist, providing medical or other occupational health services to exposed employees.

#### **Record:**

Any item, collection, or grouping of information. Examples include:

- Paper document.
- Microfiche.
- Microfilm.
- X-ray film.
- Computer record.

#### **Specific chemical identity:**

Any information that reveals the precise chemical designation of the substance, such as:

- Chemical name;

#### **OR**

- Chemical abstracts service (CAS) registry number.

**Trade secret:** Any confidential information that is used in an employer's business and gives an opportunity to gain an advantage over competitors who do not know or use it. It can be a:

- Formula.
- Pattern.
- Process.
- Device.
- Information.
- Collection of information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-14-026, § 296-816-300, filed 6/29/04, effective 9/1/04.]

## **Chapter 296-817 WAC**

### **HEARING LOSS PREVENTION (NOISE)**

#### **WAC**

296-817-100	Scope.
HEARING LOSS PREVENTION PROGRAM	
296-817-200	Summary.
296-817-20005	Conduct employee noise exposure monitoring.
296-817-20010	Control employee noise exposures that equal or exceed 90 dBA TWA <sub>8</sub> .
296-817-20015	Make sure employees use hearing protection when their noise exposure equals or exceeds 85 dBA TWA <sub>8</sub> .
296-817-20020	Make sure exposed employees receive training about noise and hearing protection.
296-817-20025	Make sure warning signs are posted for areas where noise levels equal or exceed 115 dBA.
296-817-20030	Arrange for oversight of audiometric testing.
296-817-20035	Identify and correct deficiencies in your hearing loss prevention program.
296-817-20040	Document your hearing loss prevention activities.
NOISE MEASUREMENT AND COMPUTATION	
296-817-300	Summary.
296-817-30005	Make sure that noise-measuring equipment meets recognized standards.
296-817-30010	Measure employee noise exposure.
296-817-30015	Use these equations when estimating full-day noise exposure from sound level measurements.
AUDIOMETRIC TESTING	
296-817-400	Summary.
296-817-40005	Provide audiometric testing at no cost to employees.
296-817-40010	Establish a baseline audiogram for each exposed employee.
296-817-40015	Conduct annual audiograms.

- 296-817-40020 Review audiograms that indicate a standard threshold shift.
- 296-817-40025 Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.
- 296-817-40030 Make sure a record is kept of audiometric tests.
- 296-817-40035 Make sure audiometric testing equipment meets these requirements.

OPTIONS TO AUDIOMETRIC TESTING

- 296-817-500 Summary.
- 296-817-50005 Conduct hearing protection audits at least quarterly.
- 296-817-50010 Make sure staff conducting audits are properly trained.
- 296-817-50015 Assess the hearing protection used by each employee during audits.
- 296-817-50020 Document your hearing protection audits.

THIRD-PARTY AUDIOMETRIC TESTS

- 296-817-50025 Make sure third-party hearing loss prevention programs meet the following requirements.
- 296-817-600 Noise definitions.

**WAC 296-817-100 Scope.**

The purpose of this chapter is to:

- Prevent employee hearing loss by minimizing employee noise exposures

AND

- Make sure employees exposed to noise are protected.

These goals are accomplished by:

- Measuring and computing the employee noise exposure from all equipment and machinery in the workplace, as well as any other noise sources in the work area
  - Protecting employees from noise exposure by using feasible noise controls
  - Making sure employees use hearing protection, if you cannot feasibly control the noise
  - Training employees about hearing loss prevention
  - Evaluating your hearing loss prevention efforts by tracking employee hearing or periodically reviewing controls and protection
  - Making appropriate corrections to your program.

Use Table 1 to help you determine the hearing loss prevention requirements for your workplace:

**Table 1  
Noise Evaluation Criteria**

Criteria	Description	Requirements
85 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	<ul style="list-style-type: none"> <li>– Hearing protection</li> <li>– Training</li> <li>– Audiometric testing</li> </ul>
90 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	<ul style="list-style-type: none"> <li>– Noise controls</li> <li>AND</li> <li>– Hearing protection</li> <li>– Training</li> <li>– Audiometric testing</li> </ul>

Criteria	Description	Requirements
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	<ul style="list-style-type: none"> <li>– Hearing protection</li> <li>– Signs posted in work areas warning of exposure</li> </ul>
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-817-100, filed 5/19/03, effective 8/1/03.]

**HEARING LOSS PREVENTION PROGRAM**

**WAC 296-817-200 Summary.**

**Your responsibility:**

To prevent employee hearing loss by minimizing, and providing protection from, noise exposures.

**You must:**

- Conduct employee noise exposure monitoring  
WAC 296-817-20005
- Control employee noise exposures that equal or exceed 90 dBA TWA<sub>8</sub>  
WAC 296-817-20010
- Make sure employees use hearing protection when their noise exposure equals or exceed 85 dBA TWA<sub>8</sub>  
WAC 296-817-20015
- Make sure exposed employees receive training about noise and hearing protection  
WAC 296-817-20020
- Make sure warning signs are posted for areas with noise levels that equal or exceed 115 dBA  
WAC 296-817-20025
- Arrange for oversight of audiometric testing  
WAC 296-817-20030
- Identify and correct deficiencies in your hearing loss prevention program  
WAC 296-817-20035
- Document your hearing loss prevention activities  
WAC 296-817-20040.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-817-200, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-20005 Conduct employee noise exposure monitoring.**

**You must:**

- Conduct employee noise exposure monitoring to determine the employee's actual exposure when reasonable information indicates that any employee's exposure may equal or exceed 85 dBA TWA<sub>8</sub>.

**Note:**

- Representative monitoring may be used where several employees perform the same tasks in substantially similar conditions
- Examples of information or situations that can indicate exposures which equal or exceed 85 dBA TWA<sub>8</sub>, include:
  - Noise in the workplace that interferes with people speaking, even at close range
  - Information from the manufacturer of equipment you use in the workplace that indicates high noise levels for machines in use
  - Reports from employees of ringing in their ears or temporary hearing loss

- Warning signals or alarms that are difficult to hear
- Work near abrasive blasting or jack hammering operations
- Use of tools and equipment such as the following:
  - Heavy equipment or machinery
  - Fuel-powered hand tools
  - Compressed air-driven tools or equipment in frequent use
  - Power saws, grinders or chippers
  - Powder-actuated tools.

**You must:**

- Follow applicable guidance in WAC 296-817-300 when conducting noise exposure monitoring
  - Make sure your sampling for noise exposure monitoring identifies:
    - All employees whose exposure equals or exceeds the following:
      - 85 dBA TWA<sub>8</sub> (noise dosimetry, providing an average exposure over an eight-hour time period)
      - 115 dBA (slow response sound level meter, identifying short-term noise exposures)
      - 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).
    - Exposure levels for selection of hearing protection.
  - Provide exposed employees and their representatives with an opportunity to observe any measurements of employee noise exposure that are conducted
    - Notify each employee whose exposure equals or exceeds 85 dBA TWA<sub>8</sub> of the monitoring results within five working days of when you receive the results
    - Conduct additional noise monitoring whenever a change in production, process, equipment or controls, may reasonably be expected to result in:
      - Additional employees whose exposure equals or exceeds 85 dBA TWA<sub>8</sub>
      - Employees exposed to higher level of noise requiring more effective hearing protection

**Note:** Conditions that may be expected to increase exposure include:

- Adding machinery to the work area
- Increasing production rates
- Removal or deterioration of noise control devices
- Increased use of noisy equipment
- Change in work schedule
- Change of job duties.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-20005, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-20010 Control employee noise exposures that equal or exceed 90 dBA TWA<sub>8</sub>.**

**IMPORTANT:**

Hearing protection provides a barrier to noise and protects employees but is not considered a control of the noise hazard. Separate requirements apply to hearing protection and are found in WAC 296-817-20015.

**You must:**

- Reduce employee noise exposure, using feasible controls, wherever exposure equals or exceeds 90 dBA TWA<sub>8</sub>.

**Note:** • Once noise exposures are brought below 90 dBA TWA<sub>8</sub>, no further reduction is required. However, further reduction of noise may reduce the need for other hearing loss prevention requirements

- Controls that eliminate noise at the source or establish a permanent barrier to noise are typically more reliable. For example:
  - Replacing noisy equipment with quiet equipment
  - Using silencers and mufflers
  - Installing enclosures
  - Dampening noisy equipment and parts.

- Other controls and work practices may also be useful for reducing noise exposures. Examples include:
  - Employee rotation
  - Limiting use of noisy equipment
  - Rescheduling work.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-20010, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-20015 Make sure employees use hearing protection when their noise exposure equals or exceeds 85 dBA TWA<sub>8</sub>.**

**You must:**

- Make sure employees wear hearing protectors that will provide sufficient protection when exposure equals or exceeds:
  - 85 dBA TWA<sub>8</sub> (noise dosimetry, providing an average exposure over an eight-hour time period)
  - 115 dBA (slow response sound level meter, identifying short-term noise exposures)
  - 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).
- Provide employees with an appropriate selection of hearing protectors:
  - The selection must include at least two distinct types (such as molded earplugs, foam earplugs, custom-molded earplugs, earcaps, or earmuffs) for each exposed employee and must be sufficient to cover:
    - Different levels of hearing protection needed in order to reduce all employee exposures to a level below 85 dBA TWA<sub>8</sub>
    - Different sizes
    - Different working conditions.
  - Consider requests of the employees regarding:
    - Physical comfort
    - Environmental conditions
    - Medical needs
    - Communication requirements.

**Note:** Hearing protector selection should include earplugs, earcaps and earmuffs.

**You must:**

- Provide hearing protection at no cost to employees
- Supervise employees to make sure that hearing protection is used correctly
  - Make sure hearing protectors are:
    - Properly chosen for fit
    - Replaced as necessary.
  - Make sure all hearing protection is sufficient to reduce the employee's equivalent eight-hour noise exposure to 85 dBA or less. When using the A-weighted exposure measurements, reported as "dBA TWA<sub>8</sub>," the reduction in noise exposure by hearing protectors is given by Table 2:

**Table 2**  
**Effective Protection of Hearing Protectors**

Type of hearing protection	Effective protection
Single hearing protection (earplugs, earcaps or earmuffs)	7 dB less than the manufacturer assigned noise reduction rating (NRR); for example, earplugs with an NRR of 20 dB are considered to reduce employee exposures of 95 dBA TWA <sub>8</sub> to 82 dBA TWA <sub>8</sub>
Dual hearing protection (earplug and earmuff worn together)	2dB less than the higher NRR of the two protectors; for example, earplugs with an NRR of 20 dB and earmuffs with an NRR of 12 dB are considered to reduce employee exposures of 100 dBA TWA <sub>8</sub> to 82 dBA TWA <sub>8</sub>

• In addition to protection based on daily noise dose, make sure hearing protection has an NRR of at least 20 dB when exposures involve noise that equals or exceeds 115 dBA (slow response sound level meter) or 140 dBC (fast response sound level meter).

**Note:** You may also evaluate hearing protection by using the other methods given in the NIOSH *Compendium of Hearing Protection* (NIOSH Publication No. 95-105). These methods require additional monitoring and are more complex, but provide a more thorough evaluation of protection. This may be useful in cases where communication is critical or for evaluating hearing protection for employees with hearing impairment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-20015, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-20020 Make sure exposed employees receive training about noise and hearing protection.**

**You must:**

- Train all employees whose noise exposure equals or exceeds 85 dBA TWA<sub>8</sub>
- Provide training when an employee is first assigned to a position involving noise exposure that equals or exceeds 85 dBA TWA<sub>8</sub> **and** at least annually after that
- Update information provided in the training program to be consistent with changes in controls, hearing protectors and work processes
- Make sure your noise and hearing protection training includes:
  - The effects of noise on hearing (including both occupational and nonoccupational exposures)
  - Noise controls used in your workplace
  - The purpose of hearing protectors: The advantages, disadvantages, and attenuation of various types
  - Instructions about selecting, fitting, using, and caring for hearing protection
  - The purpose and procedures for program evaluation including audiometric testing and hearing protection auditing when you choose to rely upon auditing (see WAC 296-817-500)
  - The employees' right to access records kept by the employer.

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- Maintain a written program describing initial and refresher training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-20020, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-20025 Make sure warning signs are posted for areas where noise levels equal or exceed 115 dBA.**

**You must:**

- Make sure warning signs are posted at the entrances or boundaries of all well-defined work areas where employees may be exposed to noise that equals or exceeds 115 dBA (measured using a sound level meter with slow response).
  - Warning signs must clearly indicate that the area is a high noise area and that hearing protectors are required.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-20025, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-20030 Arrange for oversight of audiometric testing.**

**You must:**

- Make sure audiometric testing as described by WAC 296-817-400 is supervised and reviewed by one of the following licensed or certified individuals:

- An audiologist
- An otolaryngologist
- Another qualified physician.

- Make sure audiograms are conducted by one of the above individuals or by a technician certified by the Council of Accreditation in Occupational Hearing Conservation (CAOHC) and responsible to a qualified reviewer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-20030, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-20035 Identify and correct deficiencies in your hearing loss prevention program.**

**You must:**

- Use audiometric testing to identify hearing loss, which may indicate program deficiencies
- Take appropriate actions when deficiencies are found with your program.

– A deficiency may be indicated when:

- Any employee experiences measurable hearing loss indicated by a standard threshold shift

**OR**

- Any employee is not wearing appropriate hearing protection during an audit when auditing is used in place of baseline audiograms for short term employees (see WAC 296-817-500, Option to audiometric testing).

**Note:** A standard threshold shift or audit deficiency does not necessarily indicate that a significant hearing loss has occurred. These criteria are intended to help identify where there may be flaws in your hearing loss prevention program that can be fixed before permanent hearing loss occurs. There are additional statistical tools and tests that may be used to improve the effectiveness of your program. Staff conducting audiometric testing and auditing may be able to suggest additional ways to improve your hearing loss prevention program and tailor it to your worksite.

**You must:**

- Evaluate the following, at a minimum, when responding to a standard threshold shift:
  - Employee noise exposure measurements

- Noise controls in the work area
- The selection of hearing protection available and refit employees as necessary
- Employee training on noise and the use of hearing protection and conduct additional training as necessary.

**Reference:** You may use the option of auditing hearing protection (see WAC 296-817-500) for employees hired or transferred to jobs with noise exposure for less than one year. You may also use audiograms provided by a third-party hearing loss prevention program in some circumstances. Details of these program options are found in WAC 296-817-500, Options to audiometric testing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-20035, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-20040 Document your hearing loss prevention activities.**

**You must:**

- Create and retain records documenting noise exposures. Include, at a minimum:
  - Exposure measurements required by this chapter for at least two years and for as long as you rely upon them to determine employee exposure
  - Audiometric test records for the duration of employment for the affected employees
  - Hearing protection audits, if you choose to rely upon them, for the duration of employment of the affected employees.

**Note:**

- You need to keep as complete a record as possible. Records developed under previous rules or in other jurisdictions need to be kept, even when they do not fulfill the full requirements of this chapter. Similarly, records found to have errors in collection or processing need to be kept if they provide an indication of employee exposure or medical condition not found in other records
- You may want to consider your other business needs, such as worker's compensation claims management, before discarding these records.

**Reference:** You need to follow additional requirements for records considered employee exposure or medical records. See chapter 296-62 WAC, Part B, Access to records for requirements for access to records, employee rights, and transfer of records.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-20040, filed 5/19/03, effective 8/1/03.]

## **NOISE MEASUREMENT AND COMPUTATION**

### **WAC 296-817-300 Summary.**

**Your responsibility:**

Conduct noise monitoring or measurement to evaluate employee exposures in your workplace.

**You must:**

Make sure that noise-measuring equipment meets recognized standards

WAC 296-817-30005

Measure employee noise exposure

WAC 296-817-30010

Use these equations when estimating full-day noise exposure from sound level measurements

WAC 296-817-30015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-300, filed 5/19/03, effective 8/1/03.]

[Title 296 WAC—p. 2842]

### **WAC 296-817-30005 Make sure that noise-measuring equipment meets recognized standards.**

**You must:**

• Make sure that noise dosimetry equipment meets these specifications:

- Dosimeters must be equipment class 2AS-90/80-5 of the American National Rule Specification for Personal Noise Dosimeters, ANSI S1.25-1991, such dosimeters are normally marked "Type 2."

**Note:** Make sure any dosimeter you use is Type 2 equipment that:

- Uses slow integration and A-weighting of sound levels.
- Has the **criterion level** set to 90 dB, so the dosimeter will report a constant 8-hour exposure at 90 dBA as a 100% dose.
- Has the **threshold level** set at 80 dB, so the dosimeter will register all noise above 80 dB.
- Uses a 5 dB **exchange rate** for averaging of noise levels over the sample period.

**You must:**

• Make sure that sound level meters meet these specifications:

- American National Standard Specification for Sound Level Meters, S1.4-1984, Type 2 requirements for sound level meters, such sound level meters are normally marked "Type 2."

■ For continuous noise measurements, the meter must be capable of measuring A-weighted sound levels with slow response

■ For impulse or impact noise measurements, the meter must be capable of indicating maximum C-weighted sound level measurements with fast response.

• Calibrate dosimeters and sound level meters used to monitor employee noise exposure:

- Before and after each day's use

**AND**

– Following the instrument manufacturer's calibration instructions.

**Note:** • You may conduct dosimetry using an exchange rate less than 5 dB and compare the results directly to the noise evaluation criteria in Table 1

- For measuring impulse and impact noise you may also use a sound level meter set to measure maximum impulse C-weighted sound levels or peak C-weighted sound levels.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060. 03-11-060, § 296-817-30005, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-30010 Measure employee noise exposure.**

**IMPORTANT:**

A noise dosimeter is the basis for determining total daily noise exposure for employees. However, where you have constant noise levels, you may estimate employee noise exposure using measurements from a sound level meter. Calculation of the employee noise exposure must be consistent with WAC 296-817-30015.

**You must:**

- Include all:
  - Workplace noise from equipment and machinery in use
  - Other noise from sources necessary to perform the work

– Noise outside the control of the exposed employees.

• Use a noise dosimeter when necessary to measure employee noise dose

- Use a sound level meter to evaluate continuous and impulse noise levels
- Identify all employees whose exposures equal or exceed the Noise Evaluation Criteria in Table 1:

**Table 1  
Noise Evaluation Criteria**

Criteria	Description	Requirements
85 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	<ul style="list-style-type: none"> <li>– Hearing protection</li> <li>– Training</li> <li>– Audiometric testing</li> </ul>
90 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	Noise controls (in addition to the requirements for 85 dBA TWA <sub>8</sub> )
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	<ul style="list-style-type: none"> <li>– Hearing protection</li> <li>– Signs posted in work areas warning of exposure</li> </ul>
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-30010, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-30015 Use these equations when estimating full-day noise exposure from sound level measurements.**

**You must:**

- Compute employee's full-day noise exposure by using the appropriate equations from Table 3 "Noise Dose Computation" **when** using a sound level meter to estimate noise dose.

**Table 3  
Noise Dose Computation**

Description	Equation
Compute the noise dose based on several time periods of constant noise during the shift	The total noise dose over the work day, as a percentage, is given by the following equation where C <sub>n</sub> indicates the total time of exposure at a specific noise level, and T <sub>n</sub> indicates the reference duration for that level. $D = 100 * ((C_1/T_1) + (C_2/T_2) + (C_3/T_3) + \dots + (C_n/T_n))$

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Description	Equation
The reference duration is equal to the time of exposure to continuous noise at a specific sound level that will result in a one hundred percent dose	The reference duration, T, for sound level, L, is given in hours by the equation: $T = 8 / (2^{((L - 90) / 5)})$
Given a noise dose as a percentage, compute the equivalent eight-hour time weighted average noise level	The equivalent eight-hour time weighted average, TWA <sub>8</sub> , is computed from the dose, D, by the equation: $TWA_8 = 16.61 * \text{Log}_{10}(D/100) + 90$

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-30015, filed 5/19/03, effective 8/1/03.]

**AUDIOMETRIC TESTING**

**WAC 296-817-400 Summary.**

**Your responsibility:**

To conduct audiometric testing of employees exposed to noise to make sure that their hearing protection is effective.

**You must:**

- Provide audiometric testing at no cost to employees  
WAC 296-817-40005
- Establish a baseline audiogram for each exposed employee  
WAC 296-817-40010
- Conduct annual audiograms  
WAC 296-817-40015
- Review audiograms that indicate a standard threshold shift  
WAC 296-817-40020
- Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing  
WAC 296-817-40025
- Make sure a record is kept of audiometric tests  
WAC 296-817-40030
- Make sure audiometric testing equipment meets these requirements  
WAC 296-817-40035.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-400, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-40005 Provide audiometric testing at no cost to employees.**

**You must:**

- Provide audiograms, including any required travel or necessary additional examinations or testing, at no cost to exposed employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-40005, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-40010 Establish a baseline audiogram for each exposed employee.**

**You must:**

- Conduct a baseline audiogram when an employee is first assigned to work involving noise exposures that equal or exceed 85 dBA TWA<sub>s</sub>.

- Make sure this audiogram is completed no more than one hundred eighty days after the employee is first assigned

**OR**

- Make sure employee is covered by a hearing protection audit program (as described by WAC 296-817-500 and available as an alternative only for employees hired for less than one year).

**Note:** Employers who utilize mobile test units are allowed up to one year to obtain a valid baseline audiogram for each exposed employee. The employees must still be given training and hearing protection as required by this chapter.

**You must:**

- Make sure employees are not exposed to workplace noise at least fourteen hours before testing to establish a baseline audiogram.

- Hearing protectors may be used to accomplish this.

- Notify employees of the need to avoid high levels of nonoccupational noise exposure (such as loud music, headphones, guns, power tools, motorcycles, etc.) during the fourteen-hour period immediately preceding the baseline audiometric examination.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-40010, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-40015 Conduct annual audiograms.**

**You must:**

- Conduct annual audiograms for employees as long as they continue to be exposed to noise that equals or exceeds 85 dBA TWA<sub>s</sub>.

**Note:** Annual audiometric testing may be conducted at any time during the work shift. By conducting the annual audiogram during the work shift with the employee exposed to typical noise for their job, the test may record a temporary threshold shift. This makes the test more sensitive to potential hearing loss and may help you improve employee protection before a permanent threshold shift occurs. A suspected temporary shift is one reason an employer may choose to retest employee hearing.

**You must:**

- Make sure each employee is informed of the results of his or her audiometric test.

- Include whether or not there has been a hearing level decrease or improvement since their previous test.

- Make sure each employee's annual audiogram is compared to his or her baseline audiogram by an audiologist, otolaryngologist, another qualified physician, or the technician conducting the test to determine if a standard threshold shift has occurred.

- If the annual audiogram indicates that an employee has suffered a standard threshold shift, you may obtain a retest within thirty days and consider the results of the retest as the annual audiogram.

- Make sure that an audiologist, otolaryngologist, or other qualified physician sees any annual audiogram that indicates a standard threshold shift.

[Title 296 WAC—p. 2844]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-40015, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-40020 Review audiograms that indicate a standard threshold shift.**

**You must:**

- Make sure the health care professional supervising audiograms has:

- A copy of this chapter

- The baseline audiogram and most recent audiogram of the employee to be evaluated

- Background noise level records for the testing room

- Calibration records for the audiometer.

- Obtain an opinion from the health care professional supervising audiograms as to whether the audiograms indicate possible occupational hearing loss and any recommendations for changes in hearing protection

- Pay for any clinical audiological evaluation or otological examination required by the reviewer, if:

- Additional review is necessary to evaluate the cause of hearing loss

**OR**

- If there is indication of a medical condition of the ear caused or aggravated by the wearing of hearing protectors.

- Inform the employee in writing of the existence of a standard threshold shift within twenty-one calendar days of the determination.

- Make arrangements for the reviewer to communicate to the employee any suspected medical conditions that are found unrelated to your workplace. This information is confidential and must be handled appropriately.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-40020, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-40025 Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.**

**You must:**

- Keep the baseline audiogram without revision, unless a qualified reviewer determines:

- The standard threshold shift revealed by the audiogram is persistent

**OR**

- The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-40025, filed 5/19/03, effective 8/1/03.]

### **WAC 296-817-40030 Make sure a record is kept of audiometric tests.**

**You must:**

- Retain a legible copy of all employee audiograms conducted under this chapter.

- Make sure the record includes:

- Name and job classification of the employee

- Date of the audiogram

- The examiner's name

- Date of the last acoustic or exhaustive calibration of the audiometer

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- Employee's most recent noise exposure assessment
- The background sound pressure levels in audiometric test rooms.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-40030, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-40035 Make sure audiometric testing equipment meets these requirements.**

**You must:**

- Use pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz
  - Tests at each frequency must be taken separately for each ear
  - Supra-aural headphones must be used.
- Conduct audiometric tests with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used according to, American National Standard Specification for Audiometers, S3.6-1996
  - Check the functional operation of the audiometer each day before use by doing all of the following:
    - Make sure the audiometer's output is free from distorted or unwanted sound
    - Test either a person with known, stable hearing thresholds or a bio-acoustic simulator
    - Perform acoustic calibration for deviations of 10 dB or greater.
  - Audiometer calibration must be checked acoustically at least annually to verify continued conformance with ANSI S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check
  - An exhaustive calibration must be performed at least every two years according to the American National Standard Specification for Audiometers, S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from the calibration.
  - Provide audiometric test rooms that meet the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms using the following table of maximum ambient sound pressure levels:

**Table 4  
Maximum Ambient Sound Pressure Levels**

Frequency (Hz)	500	1000	2000	4000	8000
Sound Pressure Level (dB)	40	40	47	57	62

**Note:** The American Industrial Hygiene Association and National Hearing Conservation Association recommend conducting audiograms using the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms with adjustments at only 500 Hz and below.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-40035, filed 5/19/03, effective 8/1/03.]

**OPTIONS TO AUDIOMETRIC TESTING**

**WAC 296-817-500 Summary.**

**Your responsibility:**

(2007 Ed.)

This section provides options to baseline audiometric testing for employees assigned to duties with noise exposures for **less than one year**. These program options may also be used to provide added assessment of longer-term employees in addition to audiometric testing.

The requirements of this section apply only if you decide to use auditing or a third-party hearing loss prevention program and do not conduct baseline audiometric testing for those employees.

**Hearing Protection Audits**

**You must:**

Conduct hearing protection audits at least quarterly  
WAC 296-817-50005

Make sure staff conducting audits are properly trained  
WAC 296-817-50010

Assess the hearing protection used by each employee during audits

WAC 296-817-50015

Document your hearing protection audits  
WAC 296-817-50020

**Third-Party Audiometric Testing**

**You must:**

Make sure third-party hearing loss prevention programs meet the following requirements

WAC 296-817-50025

**IMPORTANT:**

**Hearing protection audits** are a tool for use in evaluating your hearing loss prevention program in cases where audiometric testing does not provide a useful measure. For example, if most of your employees are hired on a temporary basis for a few months at a time, audiometric testing may not identify the small changes in hearing acuity that could occur. Auditing provides an alternative to audiometric testing in these cases.

Auditing is not required unless you use it in place of baseline audiometric testing for employees hired for a period of **less than one year** and is permitted as a substitute for audiometric testing only for these employees.

**Third-party hearing loss prevention programs** are full hearing loss prevention programs and are distinct from audiometric testing provided by third parties as part of your own hearing loss prevention program. These programs may be organized by labor groups, trade associations, labor-management cooperatives, or other organizations to:

- Cover a specific group of employees

**OR**

- Combine efforts for several employers with common employees.

Although you remain responsible for the program, third-party programs can have at least two benefits over running your own program:

- The audiometric testing is portable between the participating employers so new testing will not be needed when an employee changes employers

- Employees who only work for short periods for any one employer can be monitored under the group program over a longer period of time increasing the effectiveness of the audiometric testing in preventing hearing loss for these employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-500, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-50005 Conduct hearing protection audits at least quarterly.****You must:**

- Conduct audits at least quarterly to provide a representative assessment of your workplace
  - The assessment is representative if it:
    - Covers all processes and work activities in your business at full production levels

**AND**

- Covers all employees present on the audit day.
  - If your business is mobile or involves variable processes, auditing may need to be repeated more often than quarterly
    - Auditing does not need to be repeated more than monthly as long as a reasonable effort is made to cover:
      - The activities with greatest exposure

**AND**

- As many employees as possible.
  - Assess exposures and hearing protection for the full shift for each employee covered at the time of the audit.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-50005, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-50010 Make sure staff conducting audits are properly trained.****You must:**

- Make sure staff conducting hearing protection audits:
  - Can demonstrate competence in:
    - Evaluating hearing protection attenuation
    - Evaluating hearing protector choices
    - Assessing the correct use of hearing protectors.
  - Are certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) or have training in the following areas:
    - Noise and hearing loss prevention
    - Washington state noise regulations
    - Hearing protectors
    - Fitting of hearing protectors
    - Basic noise measurement
    - Hearing loss prevention recordkeeping.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-50010, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-50015 Assess the hearing protection used by each employee during audits.****You must:**

- Confirm that:
  - Current site conditions during audits are consistent with conditions existing during noise monitoring
  - The hearing protection used by the employee is sufficient and appropriate for the conditions
    - The hearing protection is worn properly
    - The employees are satisfied with the performance and comfort of the hearing protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-50015, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-50020 Document your hearing protection audits.****You must:**

[Title 296 WAC—p. 2846]

- Keep a record of audit results for each employee assessed for the length of their employment and for the length of time you will rely upon the audit results

- Include the following information in the record:
  - The make and model of the hearing protectors
  - The size of the protectors
  - Average noise exposure of the employee
  - Any problems found with use of the hearing protection
  - Any comments or complaints from the employee regarding the hearing protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-50020, filed 5/19/03, effective 8/1/03.]

**THIRD-PARTY AUDIOMETRIC TESTS****WAC 296-817-50025 Make sure third-party hearing loss prevention programs meet the following requirements.****IMPORTANT:**

Third-party hearing loss prevention programs are intended:

- For short-term employees hired or assigned to duties having noise exposures **for less than one year**

**AND**

- **For seasonal employees.**

However, other employees may be included as long as you meet all requirements for hearing loss follow-ups and recordkeeping.

**You must:**

- Make sure that the third-party program is:
  - Equivalent to an employer program as required by this chapter

**AND**

- Uses audiometric testing to evaluate hearing loss.
  - Make sure a licensed or certified audiologist, otolaryngologist, or other qualified physician administers the third-party program
    - Make sure the third-party program has written procedures for:
      - Communicating with participating employers of program requirements
      - Follow-up procedures for detected hearing loss
      - Annual review of participating employer programs.
    - Make sure the following program elements are corrected by you or the third-party program when deficiencies are found:
      - Noise exposures
      - Hearing protection
      - Employee training
      - Noise controls.
    - Obtain a review of your hearing loss prevention program at least once per year, conducted by the third-party program administrator or their representative, in order to:
      - Identify any tasks needing a revised selection of hearing protection

**AND**

- Provide an overall assessment of the employers' hearing loss prevention activities.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-11-060, § 296-817-50025, filed 5/19/03, effective 8/1/03.]

**WAC 296-817-600 Noise definitions.**

**A-weighted** - An adjustment to sound level measurements that reflects the sensitivity of the human ear. Used for evaluating continuous or average noise levels.

**Audiogram** - A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**Audiologist** - A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing, and Language Association, or the American Academy of Audiology, and is licensed by the state board of examiners.

**Baseline audiogram** - The audiogram against which future audiograms are compared. The baseline audiogram is collected when an employee is first assigned to work with noise exposure. The baseline audiogram may be revised if persistent standard threshold shift (STS) of improvement is found.

**Continuous noise** - Noise with peaks spaced no more than one second apart. Continuous noise is measured using sound level meters and noise dosimeters with the slow response setting.

**Criterion sound level** - A sound level of ninety decibels. An eight-hour exposure to constant 90 dBA noise is a one hundred percent noise dose exposure.

**C-weighted** - An adjustment to sound level measurements that evenly represents frequencies within the range of human hearing. Used for evaluating impact or impulse noise.

**Decibel (dB)** - Unit of measurement of sound level. A-weighting, adjusting for the sensitivity of the human ear, is indicated as "dBA." C-weighting, an even reading across the frequencies of human hearing, is indicated as "dBC."

**Fast response** - A setting for a sound level meter that will allow the meter to respond to noise events of less than one second. Used for evaluating impulse and impact noise levels.

**Hertz (Hz)** - Unit of measurement of frequency, numerically equal to cycles per second.

**Impulsive or impact noise** - Noise levels which involve maxima at intervals greater than one second. Impulse and impact noise are measured using the fast response setting on a sound level meter.

**Noise dose** - The total noise exposure received by an employee during their shift. It can be expressed as a percentage indicating the ratio of exposure received to the noise exposure received in an eight-hour exposure to constant noise at 90 dBA. It may also be expressed as the sound level that would produce the equivalent exposure during an eight-hour period (TWA<sub>8</sub>).

**Noise dosimeter** - An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

**Occupational hearing loss** - A reduction in the ability of an individual to hear either caused or contributed to by exposure in the work environment.

**Otolaryngologist** - A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

**Permanent threshold shift** - A hearing level change that has become persistent and is not expected to improve.

**Qualified reviewer** - An audiologist, otolaryngologist, or other qualified physician who has experience and training in evaluating occupational audiograms.

**Slow response** - A setting for sound level meters and dosimeters in which the meter does not register events of less than about one second. Used for evaluating continuous and average noise levels.

**Sound level** - The intensity of noise as indicated by a sound level meter.

**Sound level meter** - An instrument that measures sound levels.

**Standard threshold shift (STS)** - A hearing level change, relative to the baseline audiogram, of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

**Temporary threshold shift** - A hearing level change that improves. A temporary threshold shift may occur with exposure to noise and hearing will return to normal within a few days. Temporary threshold shifts can be indicators of exposures that lead to permanent hearing loss.

**TWA<sub>8</sub> - Equivalent eight-hour time-weighted average sound level** - That sound level, which if constant over an eight-hour period, would result in the same noise dose measured in an environment where the noise level varies.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-11-060, § 296-817-600, filed 5/19/03, effective 8/1/03.]

## Chapter 296-818 WAC ABRASIVE BLASTING

**WAC**

296-818-100	Scope.
296-818-200	General safety—Summary contents.
296-818-20005	Dust hazards.
296-818-20010	Personal protective equipment (PPE).
296-818-20015	Housekeeping.
296-818-300	Operations—Summary contents.
296-818-30005	Combustible organic abrasive.
296-818-30010	Blast cleaning enclosures.
296-818-30015	Blast cleaning nozzles.
296-818-400	Exhaust ventilation systems—Summary contents.
296-818-40005	Construction.
296-818-40010	Explosion venting and wiring.
296-818-40015	Inspection and maintenance.
296-818-500	Definitions.

**WAC 296-818-100 Scope.** This chapter applies to all abrasive blasting operations where an abrasive is forcibly applied to a surface using any of the following:

- Pneumatic pressure
- Hydraulic pressure
- Centrifugal force

**References:** Depending on your work processes, here are examples of other chapters you may need:  
 Safety and health core rules, chapter 296-800 WAC  
 Machine safety, chapter 296-806 WAC  
 Respiratory hazards, chapter 296-841 WAC  
 Respirators, chapter 296-842 WAC  
 Lead, chapter 296-857 WAC  
 Scaffolds, chapter 296-874 WAC  
 Cadmium, chapter 296-62 WAC  
 Part L, Electrical, chapter 296-24 WAC

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-100, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-200 General safety—Summary contents.**

**Your responsibility:**

To protect employees from hazards associated with their work environment

Dust hazards

WAC 296-818-20005

Personal protective equipment (PPE)

WAC 296-818-20010

Housekeeping

WAC 296-818-20015

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-200, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-20005 Dust hazards.**

**IMPORTANT:**

• Abrasives and the surface coatings on materials blasted are shattered and pulverized during blasting operations. The dust formed will contain particles that could result in the following hazards:

- Respiratory
- Fire
- Explosion

• Wet blasting methods minimize dust exposure, but dispersed droplets, mists, and dried residues may become airborne and create potential exposures.

**You must:**

• Evaluate the potential health hazards from abrasive blasting operations by considering the composition and toxicity of the abrasive material and the surface being abraded.

- References:**
- For additional hazard assessment requirements, go to these separate chapters:
    - Respirators, chapter 296-842 WAC
    - The Safety and health core rules, chapter 296-800 WAC
    - Personal protective equipment, WAC 296-800-16005.
  - For requirements on the use of Combustible organic abrasive, go to WAC 296-818-30005.

**You must:**

• Keep dust concentrations below the permissible exposure limits found in a separate chapter, Respiratory hazards, chapter 296-841 WAC.

- Note:** When sampling for dust concentrations, place the sample collection device:
- In the breathing zone of the operator;
- AND**
- Outside the respiratory protection worn.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-20005, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-20010 Personal protective equipment (PPE).**

**You must:**

- Supply and make sure personal protective equipment is worn.
- Follow the requirements in Table-1, Personal Protective Equipment (PPE).

**Table-1: Personal Protective Equipment (PPE)**

PROVIDE	WHEN
<b>Abrasive Blasting Respirators</b>	Operators work in any of the following situations: <ul style="list-style-type: none"> <li>– Inside blast cleaning rooms</li> <li>– Where silica sand is used in manual blasting operations</li> </ul>

[Title 296 WAC—p. 2848]

**Table-1: Personal Protective Equipment (PPE)**

PROVIDE	WHEN
	– Where concentrations of toxic dust exceed the permissible exposure limits found in a separate chapter: <ul style="list-style-type: none"> <li>■ Respiratory hazards, WAC 296-841-20020, Table-3 "Exposure Limits for Air Contaminants"</li> </ul> <b>Exemption:</b> <ul style="list-style-type: none"> <li>• An abrasive respirator does not need to be worn if the operator is physically separated from the nozzle and blast by an exhaust ventilated enclosure.</li> </ul> <b>Definition:</b> <p><b>Abrasive-blasting respirator</b> A supplied air or a continuous flow respirator constructed to cover and protect the operator's head, neck and shoulders from rebounding abrasive.</p>
<b>Eye and Face protection to both of the following:</b> <ul style="list-style-type: none"> <li>– Blasting operators</li> <li>– Personnel working near blasting operations</li> </ul>	Respirators worn during blasting operations do not provide eye and face protection
<b>Gloves and Aprons made of heavy canvas or leather;</b> <b>OR</b> <b>Equivalent protection</b>	Operators are exposed to the impact of rebounding abrasives

- Notes:**
- Use only respirators certified by NIOSH in 42 C.F.R. Part 84 for protecting employees from dusts, and other hazards produced during abrasive blasting operations, like:
    - Using a garnet sand to blast a concrete surface, resulting in crystalline silica dust
  - A filtering face piece may be used only for short, intermittent, or occasional dust exposures for any of the following tasks:
    - To protect the operator during abrasive blasting operations performed outside the enclosure or outdoors where nonsilica abrasives are used on materials with low toxicity
    - Clean-up
    - Dumping dust collectors
    - Unloading shipments of sand at receiving areas when the following controls are not feasible:
      - Enclosures
      - Exhaust ventilation
- OR**
- Other means
- Reference:**
- For additional requirements to help you fully protect employees, go to the following separate chapters:
    - The Safety and health core rules, chapter 296-800 WAC:
      - Personal protective equipment (PPE), WAC 296-800-160
      - Respiratory hazards, chapter 296-841 WAC
      - Respirators, chapter 296-842 WAC:
        - Respirator program, WAC 296-842-120
        - Specifications for air quality, WAC 296-842-200

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-20010, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-20015 Housekeeping.**

**You must:**

(2007 Ed.)

- Keep aisles and walkways clear of steel shot or similar abrasives that may create a slipping hazard.
- Prohibit the accumulation of dust on the floors or ledges outside blasting enclosures.
- Clean up dust spills promptly.

**Note:** Removal of accumulated dust should be done:

- With a high efficiency particulate air filter (HEPA), vacuum cleaner when the plant is not in operation;

**AND**

- By a person wearing a respirator approved for the existing conditions

**Reference:** • For additional housekeeping requirements, see the Safety and health core rules, chapter 296-800 WAC, Housekeeping, WAC 296-800-220.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-20015, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-300 Operations—Summary contents.**

**Your responsibility:**

To follow these operational requirements

Combustible organic abrasives

WAC 296-818-30005

Blast cleaning enclosures

WAC 296-818-30010

Blast cleaning nozzles

WAC 296-818-30015

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-300, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-30005 Combustible organic abrasive.**

**IMPORTANT:**

• This section applies to blasting operations where flammable or explosive dust mixtures may be present.

**You must:**

• Prohibit the use of combustible organic abrasives, except in automatic blast cleaning systems.

• Bond and ground the blast nozzle to prevent the buildup of static charges.

**Note:** Fine dust produced from combustible, organic abrasive is a fire and explosion hazard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-30005, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-30010 Blast cleaning enclosures.**

**You must:**

• Install adequate ventilation systems in blast cleaning enclosures that are able to do all of the following:

- Control concentrations of airborne contaminants below the permissible exposure limits that apply
- Provide a continuous inward flow of air at all openings in the enclosure during blasting operations
- Minimize the escape of dust into adjacent work areas
- Maintain visibility in blast cleaning rooms and cabinets
- Rapidly clear dust from the air after blasting stops
- Discharge exhaust so contaminated air does not do either of the following:

- Present a health hazard to any worker; or

- Reenter buildings in harmful amounts

- Make sure ventilation systems are designed and operated so employees are not exposed to excessive air velocities

- Make sure make-up air systems do not interfere with the effectiveness of the exhaust system, and are designed to do both of the following:

- Replace exhausted air in ample quantities
- Temper make-up (supply) air when necessary
- Do both of the following before opening the blast cleaning enclosure:
  - Turn the blast off
  - Run the exhaust system for a sufficient period of time to clear the air of dust particles
- Follow the requirements in Table-2, Blast Cleaning Enclosures.

**Table-2: Blast Cleaning Enclosures**

<b>If you have</b>	<b>Then make sure</b>
Air inlets and access openings	They are either baffled or arranged so the combination of inward airflow and baffles minimizes both of the following: <ul style="list-style-type: none"> <li>– The escape of abrasive or dust particles into adjacent work areas.</li> <li>– Visible spurts of dust</li> </ul>
Small access openings where dust might escape	Slit resistant baffles are installed in multiple sets at <b>all</b> small access openings, and do both of the following: <ul style="list-style-type: none"> <li>– Regularly inspect them</li> <li>– Replace them when needed</li> </ul>
An observation window in enclosures where hard, deep cutting abrasives are used	The window is made of safety glass protected by screening <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Hard, deep cutting abrasives may shatter normal glass.</li> </ul>
	<ul style="list-style-type: none"> <li>• If the safety glass shatters, the protective screening will help contain the glass and protect employees from cuts and lacerations.</li> </ul>
Small operator access doors	They are flanged and tight when closed, and open from both inside and outside the enclosure. <p><b>Note:</b></p> If you have a small operator access door and a large work access door, the large work access door may open or close from the outside only.

**References:** For more information on:

- Air velocities, refer to the following:
  - The latest edition of Recommended Industrial Ventilation Guidelines (ACGIH)
  - NIOSH 1976 Industrial Ventilation
- Exit routes, go to the Safety and health core rules, WAC 296-800-310.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-30010, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-30015 Blast cleaning nozzles.**

**You must:**

- Make sure nozzles are all of the following:
  - Mounted on a support when not in use
  - Equipped with operating valves that are manually held open.

- Note:**
- To help prevent the buildup of static charges, pressurized tanks used to supply abrasive should be:
    - Connected to the manual control of the nozzle;
- AND**
- Have the relief valve or opening located so it can safely vent.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-30015, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-400 Exhaust ventilation systems—  
Summary contents.**

**Your responsibility:**

To make sure exhaust ventilation systems meet these requirements

- Construction  
WAC 296-818-40005
- Explosion venting and wiring  
WAC 296-818-40010
- Inspection and maintenance  
WAC 296-818-40015

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-400, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-40005 Construction.**

**You must:**

- Make sure exhaust systems are constructed, installed, inspected, and maintained to meet both of the following:
  - The American National Standards Institute (ANSI), Z9.2-2001 for:
    - Fundamentals Governing the Design and Operation of Local Exhaust Systems
    - The National Fire Protection Association (NFPA) 91-2004 for:
      - Exhaust Systems for Air Conveying of Vapors, Gases and Noncombustible Particulate Solids.

- Reference:**
- Refer to the American National Standards Institute, ANSI Z9.4-1997 for information on the following:
    - Exhaust Systems for Abrasive-blasting Operations, Ventilation, and Safe Practices for Fixed Location Enclosures.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-40005, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-40010 Explosion venting and wiring.**

**You must:**

- Follow the requirements in Table-3 for flammable or combustible dust mixtures

**Table-3: Explosion Venting and Wiring**

If you have	Then
Flammable or explosive dust mixtures that may be present	Make sure the construction of equipment, including the exhaust system and all electrical wiring, meets both of the following:

[Title 296 WAC—p. 2850]

**Table-3: Explosion Venting and Wiring**

If you have	Then
	<ul style="list-style-type: none"> <li>• The American National Standard Installation (ANSI) of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, NFPA 91. 2004.</li> <li>• The electrical requirements for Class II locations in WAC 296-24-95613, located in Part L of chapter 296-24 WAC.</li> </ul>
	<p>Make sure blast cleaning enclosures, the ducts, and the dust collector are constructed with either loose panels or explosion venting areas that meet all of the following:</p> <ul style="list-style-type: none"> <li>• Provides pressure relief in case of an explosion.</li> <li>• Are located away from occupied areas.</li> <li>• The Guide for Deflagations, NFPA 68. 2002.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-40010, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-40015 Inspection and maintenance.**

**You must:**

- Make sure the exhaust ventilation system is fully operational by checking the static pressure drop at the exhaust ducts leading from the equipment at both of the following times:
  - When installation is completed
  - Annually after installation.
- Repair or clean exhaust systems when either of the following occur:
  - Dust leaks are found; or
  - The pressure drop gauge indicates a change exceeding 20 percent.
- Use an abrasive separator to separate larger particles for reuse on installations where abrasive is recirculated.
- Set up dust collecting equipment to do both of the following:
  - Empty and remove accumulated dust without contaminating work areas
  - Discharge the air used in blast cleaning equipment.

- Note:**
- Dispose fine dust from dry collectors by doing one of the following:
    - Emptying and transporting the fine dust in enclosed containers
    - Using a sluice with a wetting process to contain the dust.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-12-074, § 296-818-40015, filed 6/6/06, effective 9/1/06.]

**WAC 296-818-500 Definitions.**

**Abrasive:**

A solid granular substance used in abrasive blasting operations.

**Abrasive blasting:**

The forcible application of an abrasive to a surface using either:

– Pneumatic or hydraulic pressure;

**OR**

– Centrifugal force

**Abrasive-blasting respirator:**

A supplied air or a continuous flow respirator constructed with a shroud that covers and protects the head, neck, and shoulders.

**Automatic blast cleaning systems:**

A unit that has a blast cleaning chamber which usually has both of the following to provide a timed cleaning cycle:

– An automatic timer;

**AND**

– An automatic shutoff control

**Baffles:**

Partial enclosures in and around the emission sources which improve or enhance airflow at the hood.

**Blast cleaning barrel:**

A complete enclosure that rotates on an axis or an internal tread to tumble parts in order to expose various surfaces of the parts to an automatic blast spray.

**Blast cleaning room:**

An enclosed room where blasting operations are performed by an operator who works from inside the room using a blasting nozzle to direct the flow of abrasive material.

**Blasting cabinet:**

An enclosure where the operator stands outside using a blasting nozzle through an opening, or openings in the enclosure.

**Dust collector:**

A device in an exhaust ventilation system used to remove dust from air.

**Exhaust ventilation system:**

A system that removes contaminated air using the following:

- Enclosure or hood
- Duct work
- Dust collecting equipment
- Exhauster
- Discharge stack

**Local exhaust ventilation:**

The mechanical removal of contaminated air from the point where the contaminant is being generated or liberated.

**Make-up air systems:**

A ventilation system that controls the volume of outdoor air supplied to a building to replace air being exhausted.

**Rotary blast cleaning table:**

An enclosure where the pieces to be cleaned are placed on a rotating table and passed automatically through a series of blast sprays.

**Tempered make-up air:**

Air which has been conditioned by changing its heat content to get a specific desired temperature.

**Ventilation:**

The provision, circulation or exhausting of air into or from an area or space.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-12-074, § 296-818-500, filed 6/6/06, effective 9/1/06.]

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**Chapter 296-823 WAC**

**OCCUPATIONAL EXPOSURE TO BLOODBORNE PATHOGENS**

**WAC**

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**WAC 296-823-100 Scope.** This chapter provides requirements to protect employees from exposure to blood or other potentially infectious materials (OPIM) that may contain bloodborne pathogens. Examples of bloodborne pathogens are the human immunodeficiency virus (HIV) and hepatitis B virus (HBV).

This chapter applies to you if you have employees with occupational exposure to blood or OPIM, even if no actual exposure incidents have occurred.

**Definitions:**

**Occupational exposure** means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or OPIM that may result from the performance of an employee's duties.

**Exposure incident** means a specific eye, mouth, other mucous membrane, nonintact skin or parenteral contact with blood or other potentially infectious materials (OPIM) that results from the performance of an employee's duties. Examples of nonintact skin include skin with dermatitis, hangnails, cuts, abrasions, chafing, or acne.

**Parenteral contact** occurs when mucous membranes or skin is pierced by needles, human bites, cuts, or abrasions.

**Occupations that are typically covered by this chapter.** The following list illustrates a number of jobs typically associated with tasks that involve occupational exposure to blood or OPIM. The absence of a particular job from the list does not suggest that it falls outside the scope of this chapter. At the same time, employees in jobs found on the list are covered only if they have occupational exposure.

• **Health care.**

- Physicians and physicians assistants
- Nurses, nurse practitioners, dental hygienists, and other health care employees in clinics and offices
- Employees of clinical, dental, and diagnostic laboratories
- Housekeepers in health care facilities
- Staff in laundries that provide service to health care facilities
- Tissue bank personnel
- Employees in blood banks and plasma centers who collect, transport, and test blood
- Freestanding clinic employees (for example, hemodialysis clinics, urgent care clinics, health maintenance organization (HMO) clinics, and family planning clinics)
- Employees in clinics in industrial, educational, and correctional facilities
- Staff of institutions for the developmentally disabled
- Hospice employees
- Home health care workers
- Staff of nursing homes and long-term care facilities
- HIV and HBV research laboratory and production facility workers
- Medical equipment service and repair personnel
- Emergency medical technicians, paramedics, and other emergency medical service providers
- Nuclear medical technologists.

• **Occupations outside health care.**

- Fire fighters, law enforcement personnel, and correctional officers

- Workers in laundries that service public safety institutions
- Employees assigned to provide emergency first aid by their employer (as either a primary or secondary duty)
- Employees who handle or pick up regulated waste
- Hotel/motel employees that clean up blood or OPIM
- Employees of funeral homes and mortuaries.

**Regulated waste.**

Regulated waste is any of the following:

- Liquid or semiliquid blood or other potentially infectious materials (OPIM)
- Contaminated items that would release blood or OPIM in a liquid or semiliquid state, if compressed
- Items that are caked with dried blood or OPIM and are capable of releasing these materials during handling
- Contaminated sharps
- Pathological and microbiological wastes containing blood or OPIM.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-100, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-100, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-110 Planning. Summary.**

**Your responsibility:**

To plan ways to protect your employees from the risk of exposure to blood or other potentially infectious materials.

**You must:**

Determine if you have employees with occupational exposure

WAC 296-823-11005

Develop and implement a written exposure control plan

WAC 296-823-11010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-110, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-11005 Determine if you have employees with occupational exposure.**

**You must:**

- Prepare a written exposure determination if your employees have occupational exposure to blood or other potentially infectious materials (OPIM).
  - This determination must be made without considering the use of personal protective equipment (PPE).
  - Make sure the exposure determination contains:
    - A list of job classifications where all employees have occupational exposure;
    - A list of job classifications where some employees have occupational exposure and a description of all tasks and procedures or groups of related tasks and procedures with occupational exposure for these employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-11005, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-11010 Develop and implement a written exposure control plan.**

**You must:**

- Establish a written exposure control plan designed to eliminate or minimize employee exposure in your workplace.

**Note:** The elements of your exposure control plan may be located in other documents such as policies and procedures. Make sure to reference their location in your plan.

**You must:**

• Make sure the plan contains at least the following elements:

- The exposure determination, WAC 296-823-11005
- A procedure for evaluating the circumstances surrounding exposure incidents, including documentation of the routes of exposure, and the circumstances under which the exposure incident happened
- How and when you will implement applicable requirements of this rule.

**Note:** The implementation dates need to be included only until your exposure control plan is fully implemented or when you are adding new requirements to your plan.

**You must:**

• Document the infection control system used in your workplace to protect employees from exposure to blood or OPIM.

- Use universal precautions or other at least as effective infection control systems.

**Note:** Universal precautions is an infection control system that considers the blood and OPIM from all persons as containing a bloodborne disease, whether or not the person has been identified as having a bloodborne disease. Other effective infection control systems include standard precautions, universal blood-body fluid precautions, and body substance isolation. These methods define all body fluids and substances as infectious. They incorporate not only the fluids and materials covered by universal precautions and this chapter, but expand coverage to include all body fluids and substances.

• Solicit input in the identification, evaluation, and selection of effective safer medical devices. This input must be solicited from nonmanagerial employees responsible for direct patient care with potential exposure to contaminated sharps.

- Document the process you used to solicit input and include the identity of the employees or positions that were involved.

**Note:**

- You are not required to request input from every exposed employee; however, the employees selected must represent the range of exposure situations encountered in the workplace. Your safety committee may assist in identifying employees.
- Although you are required to include nonmanagerial employees, you are not prohibited from soliciting input from managerial and other employees.

**You must:**

• Make sure the exposure control plan is reviewed and updated:

- At least annually

**AND**

- Whenever necessary to:

■ Reflect new or modified tasks and procedures which affect occupational exposure

■ Reflect new or revised job classifications with occupational exposure.

◆ Reflect changes in technology that eliminate or reduce exposure to bloodborne pathogens

◆ Document consideration and implementation of appropriate commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure.

• Make sure a copy of the exposure control plan is accessible at the workplace, when exposed employees are present. For example, if the plan is stored only on a computer, all exposed employees must be trained to operate the computer.

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• Make sure a copy of the plan is provided to the employee or their representative within fifteen days of their request for a copy.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-11010, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-11010, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-120 Training. Summary.****Your responsibility:**

To train your employees about their risk of exposure to bloodborne pathogens and ways to protect themselves.

**You must:**

Provide training to your employees

WAC 296-823-12005

Provide additional training

WAC 296-823-12010

Maintain training records

WAC 296-823-12015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-120, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-12005 Provide training to your employees.****You must:**

• Make sure all employees with occupational exposure participate in a training program that is:

- Provided at no cost to them

- Conducted during compensated working hours.

• Provide training when any of the following occur:

– Before assigning tasks where occupational exposure might occur

– At least annually and within one year of the previous training.

• Make sure the content and vocabulary of your training materials are appropriate to the educational level, literacy, and language of your employees

• Make sure the person conducting the required training is knowledgeable about the subject matter as it relates to your workplace

• Make sure the training program contains at least the following elements:

- An accessible copy of this chapter and an explanation of the contents

– A general explanation of the epidemiology and symptoms of bloodborne diseases

– An explanation of how bloodborne pathogens are transmitted

– An explanation of your exposure control plan and how the employee can obtain a copy of the written plan

– An explanation of how to recognize tasks and other activities that could involve exposure to blood and other potentially infectious materials (OPIM)

– An explanation of the use and limitations of methods that will prevent or reduce exposure including:

- Equipment and safer medical devices

- Work practices

- Personal protective equipment

– Information about personal protective equipment (PPE) including:

- The types

- Proper use and limitations

- Selection
- Location
- Putting it on and taking it off
- Handling
- Decontamination
- Disposal
- Information about the hepatitis B vaccine, including:
- Information about its effectiveness
- Safety
- Method of administration
- The benefits of being vaccinated
- Offered at no cost to the employee for the vaccine and vaccination
  - Information about what actions to take and persons to contact when exposure to blood or OPIM occurs outside of the normal scope of work
  - An explanation of the procedure to follow if an exposure incident occurs, including:
    - The method of reporting the incident
    - The medical evaluation and follow-up that will be available
  - Information about the post-exposure evaluation and follow-up procedure following an exposure incident
  - An explanation of the signs and labeling or color-coding required by this chapter
  - An opportunity for interactive questions and answers with the trainer at the time of the training session.

**Note:** This may be person-to-person, by telephone, or by e-mail, as long as the employee can both ask and receive answers during the training session.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-12005, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-12010 Provide additional training.**

##### **Your must:**

- Provide additional training when you add or change tasks or procedures that affect the employee's occupational exposure.

**Note:** This training may be limited to the changes in tasks and procedures.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-12010, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-12010, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-12015 Maintain training records.**

- Maintain training records for three years from the date of the training
- Include the following information in your training records:
  - Dates of the training sessions
  - Contents or a summary of the training sessions
  - Names and qualifications of persons conducting the training
  - Names and job titles of all persons attending the training sessions.
- Provide these employee-training records upon request for examination and copying to any of the following:
  - Employees
  - Employee representatives.

##### **Helpful tool:**

##### **Training documentation**

A training documentation form is provided for your use in the resource section of this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-12015, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-130 Hepatitis B virus (HBV) vaccinations. Summary.**

##### **Your responsibility:**

To make the vaccination available to your employees so they are protected from the hepatitis B virus (HBV).

##### **You must:**

Make hepatitis B vaccination available to employees

WAC 296-823-13005

Obtain a copy of the health care professional's written opinion for hepatitis B vaccination and provide it to the employee

WAC 296-823-13010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-130, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-13005 Make hepatitis B vaccination available to employees.**

##### **Exemption:**

- You are not required to provide the hepatitis B vaccination series to employees who meet any of the following:
  - The employee has previously received the complete hepatitis B vaccination series
  - An antibody test has revealed that the employee is immune to hepatitis B
  - There are medical reasons not to give the vaccine.
- You are not required to provide the hepatitis B vaccination series to employees assigned to provide first aid only as a secondary duty, when you do all of the following:
  - Make hepatitis B vaccination available to all unvaccinated first-aid providers who render assistance in any situation involving the presence of blood or OPIM.
    - Vaccination must be made available as soon as possible, but no later than twenty-four hours after the incident.
    - Provide a reporting procedure that ensures all first-aid incidents that involve the presence of blood or OPIM are reported before the end of the work shift
    - Document first-aid incidents that involve blood or OPIM, include at least:
      - The names of all first-aid providers who rendered assistance
      - The time and date of the first-aid incident
      - A description of the first-aid incident.
  - Make sure that the hepatitis B vaccination series is available to all employees who have occupational exposure and that it is:
    - Available at no cost to the employee
    - Available to the employee at a reasonable time and location
    - Administered by or under the supervision of a licensed physician or by another licensed healthcare professional
    - Provided according to recommendations of the United States Public Health Service that are current at the time these evaluations and procedures take place
    - Available to any employee who initially declines the vaccination but later decides to accept it while they are still covered by this chapter

– Made available after the employee has received training required by this chapter and within ten working days of initial assignment.

**Link:**

You can find more information about the United States Public Health Service recommendations for hepatitis B vaccination at <http://www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm>.

**You must:**

- Make sure participation in a prevaccination screening program for antibody status is not a condition for receiving hepatitis B vaccination.
- Make sure that all laboratory tests are conducted by a laboratory licensed by the state or Clinical Laboratory Improvement Amendments (Act) (CLIA).
- Make sure employees who decline the hepatitis B vaccination, offered by you, sign a form with this statement:

"I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me."

**Helpful tool:**

**Sample declination form:**

The declination form can help you document employees who have declined the hepatitis B vaccine. You can find a copy of this form in the resource section of this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-13005, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-13005, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-13010 Obtain a copy of the health care professional's written opinion for hepatitis B vaccination and provide it to the employee.**

**You must:**

- Obtain and provide the employee a copy of the evaluating health care professional's written opinion for hepatitis B vaccination within fifteen days of the employee's evaluation.

**Note:**

- If the health care professional provides the written opinion directly to the employee, you do not need to do so.
- If the employee's personal health care professional completes the evaluation, you are not required to obtain the health care professional's written opinion.

**You must:**

- Make sure the health care professional's written opinion is limited to whether a hepatitis B vaccination is indicated and if the employee has received this vaccination
- Make sure that all other findings or diagnoses remain confidential and are **not** included in the written report.

**Reference:** Requirements for the health care professional's written opinion on post-exposure evaluation can be found in WAC 296-823-16030.

**Helpful tool:**

**Health care professional's written opinion for post-exposure evaluation and health care provider's written opinion for hepatitis B vaccination.**

These forms are available for your use in the resource section of this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-13010, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-140 Control employee exposure. Summary.**

**Your responsibility:**

To use feasible controls to eliminate or minimize occupational exposure to blood or other potentially infectious materials (OPIM).

**IMPORTANT:**

If occupational exposure remains after implementing these controls, personal protective equipment must be used. See WAC 296-823-150, Personal protective equipment.

**You must:**

Use appropriate equipment and safer medical devices to eliminate or minimize occupational exposure

WAC 296-823-14005

Handle contaminated sharps properly and safely

WAC 296-823-14010

Handle reusable sharps properly and safely

WAC 296-823-14015

Minimize splashing, spraying, splattering and generation of droplets

WAC 296-823-14020

Make sure items are appropriately labeled

WAC 296-823-14025

Make sure employees clean their hands

WAC 296-823-14030

Prohibit food, drink, and other personal activities in the work area

WAC 296-823-14035

Prohibit pipetting or suctioning by mouth

WAC 296-823-14040

Place specimens in an appropriate container

WAC 296-823-14045

Examine and label contaminated equipment

WAC 296-823-14050

Make sure your worksite is maintained in a clean and sanitary condition

WAC 296-823-14055

Handle regulated waste properly and safely

WAC 296-823-14060

Handle contaminated laundry properly and safely

WAC 296-823-14065.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-140, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-14005 Use feasible controls, including appropriate equipment and safer medical devices, to eliminate or minimize occupational exposure.**

**You must:**

- Use appropriate equipment and safer medical devices to eliminate or minimize employee exposure.
- Use work practices designed to eliminate or minimize employee exposure.

- Examine and maintain or replace equipment and safer medical devices on a regular schedule to make sure they remain effective.

- Note:**
- Examples of appropriate equipment include:
    - Sharps containers
    - Biosafety cabinets
    - Splash guards
    - Centrifuge cups
    - Specimen storage and transport containers.
  - Examples of safer medical devices include:
    - Sharps with engineered sharps injury protections (SESIP)
    - Needleless systems
    - Blunt suture needles
    - Plastic capillary tubes.
  - Examples of work practices include:
    - No-hands procedures in handling contaminated sharps
    - No hand-to-hand instrument passing.

**Definition:** **Sharps with engineered sharps injury protections (SESIP) is**  
A nonneedle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-14005, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-14005, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14010 Handle contaminated sharps properly and safely.**

**You must:**

- Make sure that you don't bend, recap, or remove contaminated needles or other contaminated sharps **unless** you can demonstrate that there is no feasible alternative or that it's required by a specific medical or dental procedure.
  - Bending, recapping or needle removal must be done by using a mechanical device or a one-handed technique.

**Note:** Demonstrating that no alternative to bending, recapping, or removing contaminated sharps is feasible, may be accomplished through written justification, supported by reliable evidence, in your exposure control plan.

**You must:**

- Make sure you don't shear or break contaminated needles.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-14010, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14015 Handle reusable sharps properly and safely.**

**You must:**

- Place contaminated reusable sharps immediately, or as soon as possible after use, in appropriate containers until properly decontaminated. Containers must be all of the following:
  - Puncture resistant
  - Labeled or color-coded as described in this chapter
  - Leakproof on the sides and bottom
  - Meet the same requirements as the container for disposable sharps, except they do not need to be closable.
    - Store or process contaminated reusable sharps so employees aren't required to reach into the container or sink by hand
    - Make sure reusable sharps containers aren't opened, emptied, or cleaned manually or in any other manner that would expose employees to contaminated sharps.

[Title 296 WAC—p. 2856]

**Reference:** Requirements for appropriate labels and color-coding are found in WAC 296-823-14025.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-14015, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-14015, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14020 Minimize splashing, spraying, splattering, and generation of droplets.**

**You must:**

- Make sure all procedures involving blood or OPIM are performed so splashing, spraying, splattering, and generation of droplets are minimized.
  - Examples include:
    - Appropriate operation and use of recommended controls for surgical power tools, lasers and electrocautery devices
    - Use of personal protective equipment when contact with blood or OPIM is reasonably anticipated
    - Making sure cleaning procedures do not generate unnecessary splashes, spraying, splattering, or generation of droplets.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-14020, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14025 Make sure items are appropriately labeled.**

- Exemptions:**
- The following are exempt from the labeling requirements of this chapter:
    - Individual containers placed in an appropriately labeled secondary container.
    - Regulated waste that has been decontaminated.
    - Containers of blood, blood components, or blood products that are labeled with their contents and have been released for transfusion or other clinical use.
    - Extracted teeth, gallstones, kidney stones, or other tissues and body substances that are given to patients.

**You must:**

- Attach appropriate labels to:
  - Containers used to store, transport, or ship blood or other potentially infectious materials (OPIM) including:
    - Refrigerators
    - Freezers.
  - Sharps containers
  - Contaminated equipment
  - Laundry bags and containers
  - Specimen containers
  - Regulated waste containers.
- Make sure that labels:
  - Include the following symbol:



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- Are all or mostly fluorescent orange or orange-red with lettering and symbol in a contrasting color

- Are attached to the container by string, wire, adhesive, or other method so they can't become lost or accidentally removed.

- Note:** Red bags or red containers may be substituted for labels as long as they're:
- Covered in the exposure control plan
  - Communicated to all affected employees (including employees of laundry services, disposal services, and transport companies) whether they're your employees or not.
  - The label does not always need to be attached to each individual container.
  - For example, a cart carrying specimen containers could be labeled, rather than each individual container.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-14025, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-14025, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14030 Make sure employees clean their hands.**

**You must:**

(1) Provide handwashing facilities that are readily accessible to employees, wherever feasible. If handwashing facilities are not feasible, provide either one of the following:

- Antiseptic towelettes
- Antiseptic hand rub product along with clean cloth/paper towels.

(2) Make sure employees clean their hands as soon as feasible after removing gloves and whenever there is the potential for contact with blood or other potentially infectious materials (OPIM). Do one of the following:

- Wash with soap and water
- Use an appropriate waterless antiseptic hand rub product or towelettes, provided there are no signs of visible contamination
- Use an appropriate waterless antiseptic hand rub product or towelettes followed by washing with soap and water as soon as possible, when hands are visibly contaminated and handwashing facilities are not immediately available.

**Note:** An appropriate waterless antiseptic hand rub product is one that contains a 60-95% alcohol solution (isopropanol or ethanol).

**You must:**

(3) Make sure employees wash any skin with soap and water, or flush mucous membranes with water as soon as feasible following contact with blood or OPIM.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-14030, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14035 Prohibit food, drink, and other personal activities in the work area.**

**You must:**

- Make sure eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is occupational exposure
- Make sure food and drink are not kept in refrigerators, freezers, shelves, cabinets, or on countertops or benchtops where there is a potential for exposure to blood or other potentially infectious materials (OPIM).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-14035, filed 4/22/03, effective 8/1/03.]

(2007 Ed.)

### **WAC 296-823-14040 Prohibit pipetting or suctioning by mouth.**

**You must:**

- Prohibit mouth pipetting or suctioning of blood or other potentially infectious materials (OPIM).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-14040, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14045 Place specimens in an appropriate container.**

**You must:**

- Place specimens of blood or other potentially infectious materials (OPIM) in an appropriate container that prevents leakage during collection, handling, processing, storage, transport, or shipping

- Make sure the container is properly labeled or color-coded and closed before being stored, transported, or shipped.

- If outside contamination of the container occurs, the container must be placed inside a second container that prevents leakage and is properly labeled or color-coded

- If the specimen could puncture the container, the container must be placed inside a second container that:

- Is puncture-resistant

- Prevents leakage during handling, processing, storage, transport, or shipping

- Is properly labeled or color-coded.

**Exemption:** When your facility handles all specimens using universal precautions or other equivalent infection control systems, you don't have to label/color-code specimens as long as the containers can be recognized as containing specimens.

This exemption only applies while these specimens/containers remain within the facility. Proper labeling or color-coding is required when specimens/containers leave the facility.

**Reference:** Requirements for appropriate labels and color-coding are found in WAC 296-823-14025.

**Helpful tool:**

### **Guidance on the handling and storage of criminal evidence**

This tool contains information about the handling and storage of criminal evidence. Criminal evidence contaminated with blood or OPIM is considered a specimen under the scope of this chapter. You can find a copy of this tool in the resource section of this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-14045, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14050 Examine and label contaminated equipment.**

**You must:**

- Examine equipment which could become contaminated with blood or other potentially infectious materials (OPIM) before servicing or shipping.

- Decontaminate this equipment and its parts as necessary unless you can demonstrate that decontamination isn't feasible

- Attach an easily seen biohazard label to the equipment stating which portions remain contaminated.

**Reference:** Requirements for appropriate labels and color-coding are found in WAC 296-823-14025.

**You must:**

• Make sure that information on contaminated equipment is communicated to all affected employees, the servicing representative, and the manufacturer as appropriate, prior to handling, servicing, or shipping so that appropriate precautions will be taken.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-14050, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-14050, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-14055 Make sure your worksite is maintained in a clean and sanitary condition.****You must:**

(1) Develop an appropriate written schedule for cleaning and decontamination based upon the following:

- The location within the facility
- Type of surface to be cleaned
- Type of contamination present
- Tasks or procedures being performed in the area.

(2) Clean and decontaminate environmental and working surfaces and all equipment after contact with blood or other potentially infectious materials (OPIM).

• Decontaminate work surfaces with an appropriate disinfectant at these times:

- After completion of a procedure
- Immediately or as soon as possible when surfaces are clearly contaminated or after any spill of blood or OPIM
- At the end of the workshift if the surface could have become contaminated since the last cleaning.

• Remove and replace protective coverings, such as plastic wrap, aluminum foil, or imperviously backed absorbent paper used to cover equipment and environmental surfaces, as soon as possible when they:

- Clearly become contaminated
- At the end of the workshift if they could have become contaminated during the shift.

• Inspect and clean (on a regularly scheduled basis) all bins, pails, cans, and similar receptacles intended for reuse that have a reasonable likelihood for becoming contaminated with blood or OPIM.

– Clean and decontaminate these types of receptacles immediately or as soon as possible when they are visibly contaminated.

• Use a brush and dustpan, tongs, forceps, or other mechanical means to clean up broken glassware that may be contaminated.

**Note:** An appropriate disinfectant is one that is effective against tuberculosis or HBV and HIV such as:

- Diluted bleach solution (1:10 or 1:100).
  - Use the 1:10 bleach solution for spills and the 1:100 bleach solution for routine cleaning
  - You can make your own bleach solution. Using household bleach (5.25% sodium hypochlorite) follow these directions:
    - For a 1:100 solution add 2 teaspoons (10 ml) to a container, then add water to make a quart (946 ml). For a 1:10 solution, add 1/3 cup (79 ml) and 1 tablespoon (15 ml) in a container, then add water to make a quart (946 ml)
    - EPA registered tuberculocidals (List B)
    - Sterilants (List A)
    - Products registered against HIV/HBV (List D).

Any of the above products are considered effective when used according to the manufacturers' instructions. Higher level disinfection may be required depending on the agent or level of decontamination.

**Link:**

These lists are available from the EPA Office of Pesticides, antimicrobial pesticides web site at <http://www.epa.gov/oppad001/chemregindex.htm>.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-14055, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-14060 Handle regulated waste properly and safely.****Definition:**

Regulated waste is any of the following:

- Liquid or semiliquid blood or other potentially infectious materials (OPIM)
- Contaminated items that would release blood or OPIM in a liquid or semiliquid state, if compressed
- Items that are caked with dried blood or OPIM and are capable of releasing these materials during handling
- Contaminated sharps
- Pathological and microbiological wastes containing blood or OPIM.

**You must:**

• Discard contaminated sharps immediately, or as soon as possible, in containers that are all of the following:

- Closable
- Puncture resistant
- Leakproof on sides and bottom
- Appropriately labeled or color-coded
- Easily accessible to personnel
- Located as close as feasible to the immediate area where sharps are used or areas sharps can be reasonably anticipated to be found (for example, laundries)
- Maintained upright throughout use
- Replaced routinely and not allowed to overflow.

**Exemption:** Work areas such as correctional facilities, psychiatric units, pediatric units, or residential homes may have difficulty placing sharps containers in the immediate use area. In such situations, alternatives such as using lockable containers or bringing containers in and out of the work area may be used.

**Note:** For additional information on placement and use of sharps containers see *Selecting, Evaluating, and Using Sharps Disposal Containers*, NIOSH Publication 97-111, January 1998. You can obtain a copy of this publication by calling 1-800-35-NIOSH or get an electronic version in pdf at <http://www.cdc.gov/niosh/publistd.htm>.

**You must:**

• Make sure when you move containers of contaminated sharps, the containers are:

- Closed prior to removal or replacement to prevent spilling or protrusion of contents during handling, storage, transport, or shipping; and
- Placed in a secondary container, if leaking is possible.

The second container must be:

- Closable
- Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping
- Appropriately labeled or color-coded.
- Make sure regulated waste other than sharps is placed in containers that are all of the following:
  - Closable
  - Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping

- Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping
- Placed in a second container if outside contamination of the primary regulated waste container occurs.
  - The second container must meet these requirements.
    - Appropriately labeled or color-coded.
- Dispose of all regulated waste according to applicable state and county regulations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-14060, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-14060, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-14065 Handle contaminated laundry properly and safely.**

#### **You must:**

- Handle laundry contaminated with blood or other potentially infectious material (OPIM) as little as possible and with a minimum of agitation
- Bag contaminated laundry or put it into a container at the location where it was used
  - Do not sort or rinse at the location of use
  - Place and transport contaminated laundry in bags or containers that are properly labeled or color-coded
  - If your facility ships contaminated laundry off-site to a second facility that doesn't use an infection control or isolation system when handling all of their soiled laundry, your facility must place the laundry in red bags or containers that are appropriately labeled.

**Note:** If your facility uses an infection control or isolation system in the handling of all soiled laundry, you can use alternative labeling or color-coding so employees recognize that the containers need to be handled using these precautions.

**Reference:** Requirements for appropriate labels and color-coding are found in WAC 296-823-14025 of this chapter.

#### **You must:**

- Place and transport wet contaminated laundry that is likely to soak through or leak to the outside, in bags or containers that will prevent such leakage.

**Reference:** You need to follow additional requirements to make sure that employees who have contact with contaminated laundry wear protective gloves and other personal protective equipment (PPE) as appropriate, see WAC 296-823-150, Personal protective equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-14065, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-14065, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-150 Personal protective equipment (PPE). Summary.**

#### **Your responsibility:**

To provide and make sure personal protective equipment is used when work practices and controls will not fully protect your employees from the risk of exposure to blood or other potentially infectious materials.

#### **You must:**

- Provide and make sure that personal protective equipment is used when there is occupational exposure
  - WAC 296-823-15005
  - Make sure gloves are worn
  - WAC 296-823-15010
  - Make sure masks, eye protection, and face shields are worn

(2007 Ed.)

WAC 296-823-15015

Wear appropriate protective clothing

WAC 296-823-15020

Make resuscitator devices available

WAC 296-823-15025

Maintain personal protective equipment

WAC 296-823-15030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-150, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-15005 Provide and make sure personal protective equipment is used when there is occupational exposure.**

#### **You must:**

- Provide at no cost to employees, appropriate personal protective equipment such as:
  - Gloves
  - Gowns
  - Laboratory coats
  - Face shields or a combination of masks and eye protection
  - Mouthpieces
  - Resuscitation bags
  - Pocket masks
  - Other ventilation devices.

**Note:** • PPE is considered "appropriate" only if it does NOT permit blood or other potentially infectious materials (OPIM) to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

#### **You must:**

- Make sure that employees use appropriate PPE.
  - In rare and extraordinary circumstances, employees can briefly and temporarily choose not to use PPE. If in their professional judgment, they believe that using PPE would prevent the delivery of health care or public safety services OR pose an increased hazard to themselves or coworkers.
    - If the employee makes this judgment, you must investigate and document to determine if changes can be made to prevent future occurrences of the same situation
    - Make sure that appropriate PPE, in sizes to fit your employees, is readily accessible at the worksite or issued to employees
    - Make sure employees remove all PPE before leaving the work area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-15005, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-15010 Make sure gloves are worn.**

#### **You must:**

- Make sure gloves appropriate to the situation are worn when:
  - It can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials (OPIM), mucous membranes, or skin that is not intact
  - Handling or touching contaminated items or surfaces
  - Performing vascular access procedures, for example, drawing blood or inserting an IV.

[Title 296 WAC—p. 2859]

**You must:**

- Do the following when you are an employer in a volunteer blood donation center and you make the judgment that employees do not require routine use of gloves when performing phlebotomies:

- Periodically reevaluate your decision not to require gloves

- Make gloves available to all employees who wish to use them for phlebotomy (blood drawing)

- Do not discourage the use of gloves for phlebotomy

- Require that gloves be used for phlebotomy in ANY of the following circumstances:

- When the employee has a cut, scratch, or other break in the skin of his or her hand or wrist

- When the employee judges that hand contamination with blood may occur; for example, when performing phlebotomy on an uncooperative individual

- When the employee is receiving training in phlebotomy.

**You must:**

- Make sure employees who are allergic to the gloves that are normally provided have ready access to at least one of the following:

- Nonlatex gloves

- Glove liners

- Powderless gloves

- Other similar alternatives.

- Replace disposable (single use) gloves such as surgical or examination gloves:

- As soon as practical when contaminated

- As soon as practical if they are torn or punctured

- When their ability to function as a barrier is compromised.

- Make sure disposable (single use) gloves are used only once

- Discard utility gloves if they are cracked, peeling, torn, punctured, or show other signs of deterioration or when their ability to function as a barrier is compromised.

- You may decontaminate utility gloves for reuse if they can continue to function as a barrier.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-15010, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-15010, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-15015 Make sure appropriate masks, eye protection, and face shields are worn.****You must:**

- Make sure either chin-length face shields or a combination of masks and eye protection are used, whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials (OPIM) may be generated and eyes, nose, or mouth contamination can be reasonably anticipated.

**Note:** Examples of eye protection devices include goggles and glasses with solid side shields.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-15015, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-15015, filed 4/22/03, effective 8/1/03.]

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**WAC 296-823-15020 Wear appropriate protective clothing.****You must:**

- Make sure appropriate protective clothing is worn when splashes to skin or clothes are reasonably anticipated. The type and characteristics will depend upon the sort of work being done and how much exposure is anticipated.

**Note:** Examples of protective clothing include:

- Gowns

- Aprons

- Lab coats

- Clinic jackets

- Similar outer garments

- Surgical caps or hoods

- Shoe covers or boots.

**You must:**

- Remove a garment as soon as feasible if blood or other potentially infectious materials (OPIM) penetrate it.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-15020, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-15020, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-15025 Make resuscitator devices available.****You must:**

- Make resuscitator (emergency ventilation) devices readily available and accessible to employees who can reasonably be expected to perform resuscitation procedures.

**Note:** Examples of resuscitator devices include:

- Masks

- Mouthpieces

- Resuscitation bags

- Shields/overlay barriers.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-15025, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-15030 Maintain personal protective equipment.****You must:**

- Clean, repair, replace, launder, and dispose of personal protective equipment required by this chapter, at no cost to the employee

- Make sure when PPE is removed, it is placed in an appropriately designated area or container for storage, washing, decontamination, or disposal.

**Note:** Contaminated personal clothing is considered PPE for the purposes of this section.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-15030, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-160 Post-exposure requirements. Summary.****Your responsibility:**

To make sure employees who have been exposed to blood or other potentially infectious materials (OPIM) have appropriate post-exposure evaluation and follow-up available.

**You must:**

Make a confidential medical evaluation and follow-up available to employees who experience an exposure incident

WAC 296-823-16005

Test the blood of the source person

WAC 296-823-16010

(2007 Ed.)

Provide the results of the source person's blood test to the exposed employee

WAC 296-823-16015

Collect and test the blood of the exposed employee

WAC 296-823-16020

Provide information to the health care professional evaluating the employee

WAC 296-823-16025

Obtain and provide a copy of the health care professional's written opinion on post-exposure evaluation to the employee

WAC 296-823-16030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-160, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-160, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-16005 Make a confidential medical evaluation and follow-up available to employees who experience an exposure incident.**

**You must:**

- Make immediately available a confidential post-exposure evaluation and follow-up to all employees with occupational exposure to blood or OPIM who report an exposure incident.

**Definition:**

**Exposure incident.** Means a specific eye, mouth, other mucous membrane, nonintact skin or parenteral contact with blood or other potentially infectious materials (OPIM) that results from the performance of an employee's duties. Examples of nonintact skin include skin with dermatitis, hangnails, cuts, abrasions, chafing, or acne.

**You must:**

- Make sure that the post-exposure medical evaluation and follow-up are all of the following:

- Immediately available following an exposure incident
- Confidential

- At no cost to the employee

- At a reasonable time and place

- Administered by or under the supervision of a licensed physician or by another licensed healthcare professional

- Provided according to recommendations of the United States Public Health Service current at the time these evaluations and procedures take place.

- Make sure that the evaluation and follow-up includes AT LEAST these elements:

- Documentation of the routes of exposure, and the circumstances under which the exposure incident happened

- Identification and documentation of the source individual, unless you can establish that identification is infeasible or prohibited by state or local law

- Collection and testing of blood to detect the presence of HBV and HIV

- Post-exposure preventive treatment, when medically indicated, as recommended by the United States Public Health Service

- Counseling

- Evaluation of reported illnesses.

- Make sure that all laboratory tests are conducted by a laboratory licensed by the state or Clinical Laboratory Improvement Amendments Act (CLIA).

(2007 Ed.)

**Note:** The employer or a third-party healthcare provider identified by the employer may do the evaluation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-16005, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-16005, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-16010 Test the blood of the source person.**

**Exemption:** When the source individual is already known to be infected with HBV or HIV, you do not need to test their status.

**You must:**

- Arrange to test the source individual's blood for HBV and HIV as soon as feasible after getting their consent.

- If you do not get consent, you must establish that legally required consent can not be obtained

- When the law does not require the source individual's consent, their blood, if available, must be tested and the results documented.

**Note:** • Your local health authority enforces rules regarding HIV testing and consent which are found in WAC 246-100-206, Special diseases—Sexually transmitted diseases, and WAC 246-100-207, Human immunodeficiency virus (HIV) testing.

These rules can be found at: <http://www.leg.wa.gov/wac> and click on Title 246 WAC.

• Source testing: According to the Centers for Disease Control and Prevention (CDC), hepatitis C virus (HCV) infection is the most common chronic bloodborne infection in the United States. The CDC recommends testing of the source person for the presence of anti-HCV antibody. (Updated *U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis*, MMWR, June 29, 2000/50(RR11); 1-42.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-16010, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-16010, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-16015 Provide the results of the source person's blood test to the exposed employee.**

**You must:**

- Make sure the results of the source person's blood test are provided to the exposed employee, if possible

- Make sure the exposed employee is informed of applicable laws and regulations regarding disclosure of the identity and infection status of the source person.

**Note:** Law and regulations that currently apply are:

- Chapter 70.02 RCW, Medical records—Healthcare information access and disclosure.

- Chapter 70.24 RCW, Control and treatment of sexually transmitted diseases.

- Both rules can be found at <http://www.leg.wa.gov/wac> and click on Title 70 WAC to find these rules.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-16015, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-16015, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-16020 Collect and test the blood of the exposed employee.**

**You must:**

- Arrange to have the exposed employee's blood collected and tested as soon as feasible after consent is obtained.

- If the employee consents to baseline blood collection, but does not give consent at that time for HIV serologic testing, the sample must be preserved for at least ninety days. If, within ninety days of the exposure incident, the employee

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chooses to have the baseline sample tested, it must be done as soon as possible.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-16020, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-16025 Provide information to the health care professional evaluating the employee.**

#### **You must:**

- Provide ALL of the following information to the health care professional evaluating an employee after an exposure incident:

- A copy of WAC 296-823-160
- A description of the job duties the exposed employee was performing when exposed
- Documentation of the routes of exposure and circumstances under which exposure occurred
- Results of the source person's blood testing, if available
- All medical records that you are responsible to maintain, including vaccination status, relevant to the appropriate treatment of the employee.

**Reference:** Requirements for the health care professional's written opinion for hepatitis B vaccinations can be found in WAC 296-823-13010.

**Note:** You may meet the requirement to provide a copy of WAC 296-823-160 to the health care professional by giving them the <http://www.lni.wa.gov/rules/>, as long as their office has a computer and access to the labor and industries' web site.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-16025, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-16025, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-16030 Obtain and provide a copy of the health care professional's written opinion on post-exposure evaluation to the employee.**

#### **You must:**

- Obtain and provide to the employee a copy of the evaluating health care professional's written opinion within fifteen days of the completion of their evaluation.

**Note:**

- If the health care professional provides the written opinion directly to the employee, you do not need to do so
- If the employee's personal health care professional completes the evaluation, you are not required to obtain the health care professional's written opinion.

- Make sure the health care professional's written opinion is limited to the following information:
  - That the employee has been informed of the results of the evaluation
  - That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials (OPIM) which need further evaluation or treatment.

- Make sure that all other findings or diagnoses remain confidential and are NOT included in the written report.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-16030, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-16030, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-170 Records. Summary.**

#### **Your responsibility:**

To obtain and maintain required records.

#### **You must:**

Establish and maintain medical records

### **WAC 296-823-17005**

Maintain a sharps injury log

### **WAC 296-823-17010.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-170, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-17005 Establish and maintain medical records.**

#### **You must:**

- Establish and maintain an accurate medical record for each employee with occupational exposure
- Make sure this record includes ALL of the following that apply:

- Name and Social Security number of the employee
- A copy of the employee's hepatitis B vaccination status, including the dates of all the hepatitis B vaccinations
- Any medical records related to the employee's ability to receive vaccinations
- The HBV declination statement
- A copy of all results of examinations, medical testing, and follow-up procedures related to post-exposure evaluations

- Your copy of the health care professional's written opinion

- A copy of the information provided to the health care professional as required.

- Make sure that employee medical records are:

- Kept confidential
- Not disclosed or reported to any person, without the employee's written consent, except as required by this section or as may be required by law.

**Note:**

- In some industries, a medical record is also known as the employee health file.
- You may contract with the medical professional responsible for hepatitis B vaccination and post-exposure evaluation to maintain employee records.

**Reference:** You need to follow additional requirements for medical records found in WAC 296-62-052, Access to records.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-17005, filed 4/22/03, effective 8/1/03.]

### **WAC 296-823-17010 Maintain a sharps injury log.**

**Exemption:** You are exempt from the requirements to record contaminated sharps injuries if you have ten or less employees.

#### **You must:**

- Record contaminated sharps injuries on your OSHA 300 or equivalent log.

**Reference:** Requirements for the OSHA 300 log are found in chapter 296-27 WAC, Recordkeeping and reporting. <http://www.lni.wa.gov/wisha/regs/WACS/27/27.htm>.

#### **You must:**

- Record and maintain contaminated sharps injury information in a way that protects the confidentiality of the injured employee

- Also record the following additional information for contaminated sharps injuries:

- The type and brand of device involved in the incident
- The department or work area where the exposure incident occurred
- An explanation of how the incident occurred.
- Maintain your contaminated sharps injury records for five years.

**Note:** You may record the additional information in any format you choose, such as on the OSHA 300 and 301 forms. It must be retrievable and identifiable to each specific injury.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-17010, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-17010, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-180 Additional requirements for HIV and HBV research laboratories and production facilities. Summary.**

**Your responsibility:**

To implement and enforce these additional rules in research laboratories and production facilities engaged in the culture, production, concentration, experimentation, and manipulation of HIV and HBV.

**Exemption:** This section does NOT apply to clinical or diagnostic laboratories engaged solely in the analysis of blood, tissues, or organs.

**Note:** Production and research facilities: Hepatitis C (HCV) is the virus involved in most cases of parenterally transmitted (bloodborne) non-A, non-B hepatitis in the United States. Most individuals who contract HCV become chronically infected (85%) and develop chronic hepatitis (70%). It is recommended that you also follow these requirements for HCV production and research facilities.

**You must:**

Prepare, review and update a biosafety manual

WAC 296-823-18005

Follow these special practices for the work area

WAC 296-823-18010

Make sure these practices for contaminated material and waste are followed

WAC 296-823-18015

Make sure these special practices for personal protective equipment (PPE) and other safe guards are followed

WAC 296-823-18020

Protect vacuum lines

WAC 296-823-18025

Use and handle hypodermic needles and syringes appropriately and safely

WAC 296-823-18030

Handle all spills and accidents properly

WAC 296-823-18035

Post signs

WAC 296-823-18040

Provide additional training for facility employees

WAC 296-823-18045

Furnish a sink for washing hands and a readily available eye wash facility

WAC 296-823-18050

Make sure these additional criteria are followed

WAC 296-823-18055.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-180, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-180, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-18005 Prepare, review, and update a biosafety manual.**

**You must:**

• Prepare or adopt a biosafety manual. This manual must be:

– Periodically reviewed

– Updated at least annually or more often, if necessary.

• Make sure employees are:

– Advised of potential hazards

– Required to read and follow instructions about practices and procedures.

• Establish written policies and procedures where only authorized persons can enter work areas and animal rooms.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-18005, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-18010 Follow these special practices for the work area.**

**You must:**

• Make sure only authorized persons are allowed to enter the work areas and animal rooms. Authorized persons must:

– Have been advised of the potential biohazard

– Meet any specific entry requirements

– Comply with all entry and exit procedures.

• Keep laboratory doors closed when work involving HIV or HBV is in progress.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-09-110, § 296-823-18010, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-18015 Make sure these practices for contaminated material and waste are followed.**

**You must:**

• Incinerate or decontaminate all regulated waste by a method known to effectively destroy bloodborne pathogens, such as autoclaving

• Make sure to place materials to be decontaminated away from the work area in a container that is:

– Durable

– Leakproof

– Appropriately labeled, or color-coded

– Closed before being removed from the work area.

**Reference:** You can find additional requirements for appropriate labels and color-coding in WAC 296-823-14025.

**You must:**

• Incinerate or decontaminate ALL waste from work areas and from animal rooms before disposal

• Make sure an autoclave is available for decontamination of regulated waste. The autoclave must be available within or as near as possible to the work area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-12-070, § 296-823-18015, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-18015, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-18020 Make sure these special practices for personal protective equipment (PPE) and other safe guards are followed.**

**You must:**

• Make sure appropriate personal protective clothing is used in work areas and animal rooms. Examples of appropriate personal protective clothing include:

– Laboratory coats

– Gowns

– Smocks

– Uniforms.

• Decontaminate protective clothing before it is laundered

• Make sure employees remove protective clothing before leaving their work area

- Take special care to avoid skin contact with other potentially infectious materials (OPIM)

- Wear gloves when handling infected animals and when you can not avoid making hand contact with OPIM

- Conduct all activities involving OPIM in biological safety cabinets or other physical-containment devices within the containment module. No work with OPIM must be conducted on the open bench.

- Appropriate certified biological safety cabinets (Class I, II, or III) or personal protection or physical containment devices must be used for all activities with OPIM that pose a threat of exposure to droplets, splashes, spills, or aerosols. Appropriate personal protection and physical containment devices include:

- Special protective clothing

- Respirators

- Centrifuge safety cups

- Sealed centrifuge rotors

- Containment caging for animals.

- Biological safety cabinets must be certified when installed or moved, and at least annually.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-18020, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-18025 Protect vacuum lines.**

##### **You must:**

- Protect vacuum lines with liquid disinfectant traps and high-efficiency particulate air (HEPA) filters or filters of same or greater efficiency. Make sure filters are checked routinely and maintained or replaced as necessary.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-18025, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-18030 Use and handle hypodermic needles and syringes appropriately and safely.**

##### **You must:**

- Use hypodermic needles and syringes only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles.

- Use only needle-locking syringes or disposable syringe-needle units (when the needle is integral to the syringe) for the injection or aspiration of other potentially infectious materials (OPIM)

- Use extreme caution when handling needles and syringes

- The needle must not be bent, sheared, replaced in the sheath or guard, or removed from the syringe after use

- Place the needle and syringe promptly in a puncture-resistant container and autoclave or decontaminate before reuse or disposal.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-18030, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-18035 Handle all spills and accidents properly.**

##### **You must:**

- Make sure appropriate professional staff or others, properly trained and equipped to work with concentrated potentially infectious materials, immediately contain and clean up all spills

[Title 296 WAC—p. 2864]

- Make sure that employees report a spill or accident that results in an exposure incident immediately to the laboratory director or other responsible person.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-18035, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-18040 Post signs.**

##### **You must:**

- Post signs at the entrance to work areas and all access doors when other potentially infectious materials (OPIM) or infected animals are present in the work area or containment module.

- Make sure signs:

- Contain the following symbol and information:



(Name of the infectious agent)

(Special requirements for entering the area)

(Name, telephone number of the laboratory director or other responsible person.)

- Are all or mostly fluorescent orange-red with lettering and symbol in a contrasting color.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-823-18040, filed 4/22/03, effective 8/1/03.]

#### **WAC 296-823-18045 Provide additional training for facility employees.**

##### **You must:**

- Provide initial training to employees in HIV or HBV research laboratories or production facilities in addition to the training required in WAC 296-823-120

- Make sure that employees demonstrate proficiency in the following:

- Standard microbiological practices and techniques

- The practices and operations specific to the facility BEFORE being allowed to work with HIV or HBV.

- Provide a training program to employees working with HIV or HBV who have no prior experience in handling human pathogens.

- Initial work activities must not include the handling of infectious agents

- A progression of work activities must be assigned as techniques are learned and proficiency is developed.

- Make sure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-18045, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-18045, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-18050 Furnish a sink for washing hands and a readily available eye wash facility.**

**You must:**

- Make sure each work area contains a sink for hand-washing and an eyewash facility is readily available.
  - For HIV and HBV production facilities, the sink must be operated automatically or by foot or elbow and must be located near the exit door of the work area.

**Reference:** Requirements for emergency eyewash stations can be found in WAC 296-800-15030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-18050, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-18050, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-18055 Make sure these additional criteria are followed.**

**You must:**

- Separate the HIV and HBV work areas from areas that are open to unrestricted traffic flow within the building
- Use two sets of doors to separate HIV and HBV work areas from access corridors or other contiguous areas.

**Note:** You may provide a physical separation of the high-containment work area from access corridors or other areas or activities by providing:

- A double-doored clothes-change room (showers may be included)
- Airlock

**OR**

- Other access facilities that require passing through two sets of doors before entering the work area.

- Make sure the surfaces of doors, walls, floors, and ceilings in the work area are water resistant so they can be easily cleaned. These surfaces must be sealed or capable of being sealed to facilitate decontamination
- Make sure access doors to the work area or containment module are self-closing
- Provide a ducted exhaust-air ventilation system. This system must create directional airflow that draws air into the work area through the entry area and you must verify this airflow. The exhaust air must:
  - NOT be recirculated to any other area of the building
  - Be discharged to the outside
  - Be dispersed away from occupied areas and air intakes.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-18055, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-18055, filed 4/22/03, effective 8/1/03.]

**WAC 296-823-200 Definitions.**

**Blood**

Human blood, human blood components and products made from human blood. Also included are medications derived from blood, such as immune globulins, albumin, and factors 8 and 9.

**Bloodborne pathogens**

Pathogenic microorganisms that are present in human blood and can cause disease in humans. Examples of these pathogens include:

- Human immunodeficiency virus (HIV)
- Hepatitis B virus (HBV)
- Hepatitis C virus, malaria

- Syphilis
- Babesiosis
- Brucellosis
- Leptospirosis
- Arboviral infections
- Relapsing fever
- Creutzfeld-Jakob Disease
- Human T-lymphotrophic virus Type I
- Viral Hemorrhagic Fever.

**Clinical laboratory**

A workplace where diagnostic or other screening procedures are performed on blood or other potentially infectious materials (OPIM).

**Contaminated**

The presence or the reasonably anticipated presence of blood or other potentially infectious materials (OPIM) on an item or surface.

**Contaminated laundry**

Laundry that has been soiled with blood or other potentially infectious materials (OPIM) or may contain contaminated sharps.

**Contaminated sharps**

Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

**Decontamination**

The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

**Exposure incident**

A specific eye, mouth, other mucous membrane, nonintact skin or parenteral contact with blood or other potentially infectious materials (OPIM) that results from the performance of an employee's duties. Examples of nonintact skin include skin with dermatitis, hangnails, cuts, abrasions, chafing, or acne.

**Handwashing facilities**

A facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

**Licensed healthcare professional**

A person whose legally permitted scope of practice allows him or her to independently perform the activities required by this rule.

**Needleless systems**

A device that does not use needles for any of the following:

- The collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established
- The administration of medication or fluids
- Any other procedure involving the potential for occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps.

**Occupational exposure**

Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or OPIM that may result from the performance of an employee's duties.

**Other potentially infectious materials (OPIM)**

Includes all of the following:

- Human body fluids: Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;

- Any unfixed tissue or organ (other than intact skin) from a human (living or dead);

- HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV

- Blood and tissues of experimental animals infected with bloodborne pathogens.

#### **Parenteral contact**

When mucous membranes or skin is pierced by needlesticks, human bites, cuts, or abrasions.

#### **Personal protective equipment (PPE)**

Specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (for example, uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be PPE.

#### **Production facility**

A facility engaged in industrial-scale, large-volume or high concentration production of HIV or HBV.

#### **Regulated waste**

Regulated waste is any of the following:

- Liquid or semiliquid blood or other potentially infectious materials (OPIM)

- Contaminated items that would release blood or OPIM in a liquid or semiliquid state, if compressed

- Items that are caked with dried blood or OPIM and are capable of releasing these materials during handling

- Contaminated sharps

- Pathological and microbiological wastes containing blood or OPIM.

#### **Research laboratory**

A laboratory producing or using research-laboratory-scale amounts of HIV or HBV. Research laboratories may produce high concentrations of HIV or HBV but not in the volume found in production facilities.

#### **Safer medical devices**

Medical devices that have been engineered to reduce the risk of needlesticks and other contaminated sharps injuries. These include not only sharps with engineered sharps injury protections and needleless systems but also other medical devices designed to reduce the risk of sharps injury exposures to bloodborne pathogens. Examples include blunt suture needles and plastic or mylar-wrapped glass capillary tubes.

#### **Secondary duty**

Any job expectation outside the primary job duties assigned to that position.

#### **Sharps with engineered sharps injury protections (SESIP)**

A nonneedle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident.

#### **Source person**

A person, living or dead, whose blood or other potentially infectious materials may be a source (OPIM) of occupational exposure to the employee. Examples include:

- Hospital and clinic patients
- Clients in institutions for the developmentally disabled
- Trauma victims
- Clients of drug and alcohol treatment facilities
- Residents of hospices and nursing homes
- Human remains
- Individuals who donate or sell blood or blood components.

#### **Standard microbiological practices**

Standard microbiological practices refer to procedures comparable to those outlined in the current edition of the Center for Disease Control "*Biosafety in Microbiological and Biomedical Laboratories.*"

#### **Sterilize**

The use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

#### **Universal precautions**

An approach to infection control. According to the concept of universal precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

**Note:** Universal Blood-Body Fluid Precautions, Body Substance Isolation, and Standard Precautions expand on the concept of universal precautions to include all body fluids and substances as infectious. These concepts are acceptable alternatives to universal precautions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-12-070, § 296-823-200, filed 6/1/04, effective 9/1/04; 03-09-110, § 296-823-200, filed 4/22/03, effective 8/1/03.]

## **Chapter 296-824 WAC EMERGENCY RESPONSE**

### **WAC**

296-824-100	Scope.
296-824-110	Reserved.
296-824-11010	Reserved.
296-824-11020	Reserved.
296-824-11050	Reserved.
296-824-11060	Reserved.
296-824-12010	Reserved.
296-824-12020	Reserved.
296-824-12030	Reserved.
296-824-12040	Reserved.
296-824-12050	Reserved.
296-824-12060	Reserved.
296-824-13010	Reserved.
296-824-13020	Reserved.
296-824-13030	Reserved.
296-824-14010	Reserved.
296-824-15010	Reserved.
296-824-200	Planning.
296-824-20005	Develop an emergency response plan.
296-824-300	Training.
296-824-30005	Train your employees.
296-824-400	Medical surveillance.
296-824-40005	Provide medical surveillance to employees.
296-824-40010	Keep records.
296-824-500	Incident requirements.
296-824-50005	Recognize emergencies and initiate a response.
296-824-50010	Implement and maintain an incident command system (ICS).
296-824-50015	Prepare skilled support personnel.
296-824-50020	Make sure the incident commander oversees activities during the response.

296-824-50025	Use the buddy system in danger areas.
296-824-50030	Provide rescue and medical assistance.
296-824-600	Personal protective equipment.
296-824-60005	Personal protective equipment.
296-824-60010	Control hazards created by personal protective equipment (PPE).
296-824-60015	Use personal protective equipment (PPE) properly.
296-824-700	Postemergency response.
296-824-70005	Follow the appropriate postemergency response requirements.
296-824-800	Definitions.

**WAC 296-824-100 Scope.** This chapter states the minimum requirements that help you protect the safety and health of your employees during a response to a *hazardous substance releases* in your *workplace* or any other location.

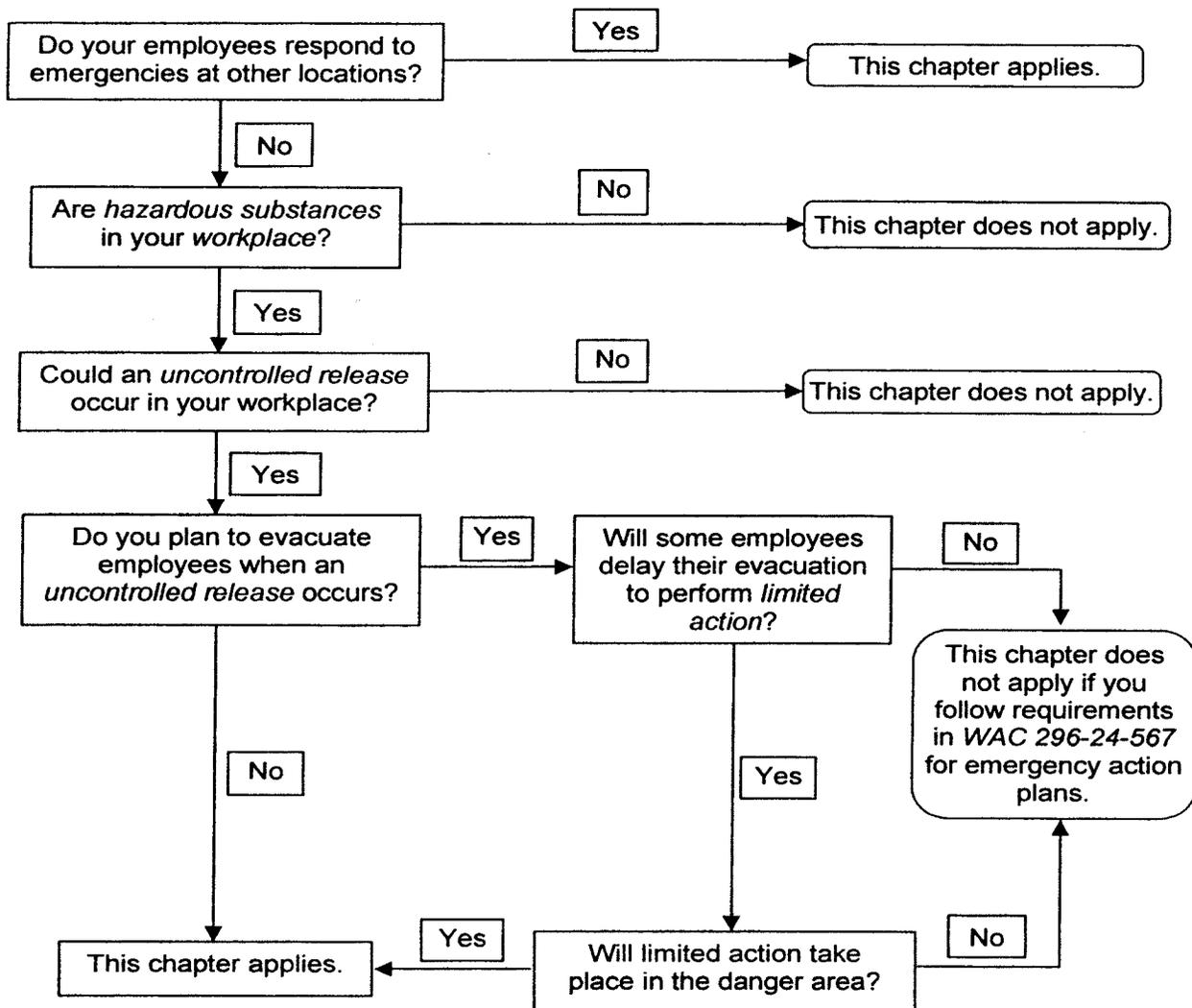
This chapter applies if your employees are, or could become, involved in responding to uncontrolled releases of hazardous substances in your workplace or any other loca-

tion. Use the scope flow chart, and definitions that follow, to determine if this chapter applies to your workplace(s). Defined words are italicized in the flow chart.

**EXEMPTION:**

- This chapter does not apply to you if your workplace is a hazardous waste site. If you are not sure about your site classification, see chapter 296-62 WAC, Part P, Hazardous waste operations and treatment, storage, and disposal facilities.
- If your workplace is a treatment, storage, and disposal site this chapter may apply.

**Note:** Requirements in other chapters may also apply to your workplace. You will find some safety and health requirements (for example, personal protective equipment) are addressed on a general level in the WISHA Safety and Health Core Rules, chapter 296-800 WAC, while being addressed for a specific application in this rule. When this happens, both requirements apply and should not conflict. If you are uncertain which requirements to follow, you must comply with the more protective requirement. Contact your local L&I office if you need assistance in making this determination.



**Definitions applicable to the flow chart.** (See WAC 296-824-800 for additional definitions used in the chapter):

***Danger area***

Areas where conditions pose a serious danger to employees, such as areas where:

- Immediately dangerous to life or health (IDLH) conditions could exist
- OR
- High levels of exposure to toxic substances could exist
- OR

• There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

**Emergency response**

A response to an anticipated release of a hazardous substance that is, or could become, an *uncontrolled release*.

**Hazardous substance**

Any biological, radiological, or chemical substance that can have adverse effects on humans. (See WAC 296-824-800 for a more specific definition.)

**Immediately dangerous to life or health (IDLH)**

Any atmospheric condition that would:

- Cause an immediate threat to life
- Cause permanent or delayed adverse health effects
- Interfere with an employee's ability to escape

**Incidental release**

A release that can be safely controlled at the time of the release and does not have the potential to become an *uncontrolled release*.

Example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

**Limited action**

Action necessary to:

- Secure an operation during emergency responses,
- OR**
- Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

**Release**

A spill, leak, or other type of hazardous substance discharge.

**Uncontrolled release**

A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

Examples of conditions that could create a significant safety and health risk:

- Large-quantity releases
- Small-releases that could be highly toxic
- Potentially contaminated individuals arriving at hospitals
- Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

**Workplace**

- A fixed facility

**OR**

- A temporary location (such as a traffic corridor)

**OR**

- Locations where employees respond to emergencies.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-100, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-100, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-110 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-110, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-110, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-11010 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-11010, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-11010, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-11020 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-11020, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-11020, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-11050 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-11050, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-11050, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-11060 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-11060, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-11060, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-12010 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-12010, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-12010, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-12020 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-12020, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-12020, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-12030 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-12030, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-12030, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-12040 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-12040, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-12040, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-12050 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-12050, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-12050, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-12060 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-12060, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-12060, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-13010 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-13010, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-13010, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-13020 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-13020, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-13020, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-13030 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-13030, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-13030, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-14010 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-14010, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-14010, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-15010 Reserved.**

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-15010, filed 9/24/02, effective 10/1/02. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-11-141, § 296-824-15010, filed 5/22/02, effective 10/1/02.]

**WAC 296-824-200 Planning.**

**Your Responsibility:**

To anticipate and plan for emergency response operations.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-200, filed 9/24/02, effective 10/1/02.]

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**WAC 296-824-20005 Develop an emergency response plan.**

- Note:**
- You may already have an emergency response plan, such as required by chapter 296-62 WAC, Part P, Hazardous waste operations and treatment, storage and disposal facilities or by state and locally coordinated response efforts (Section 303 of Superfund Amendments and Reauthorization Act (SARA), Title III). You may use those plans to comply with this section, if they include the items listed below.
  - Before a written emergency response plan can be developed, you will need to anticipate the types of uncontrolled releases that employees could encounter in your workplace(s).

**You must:**

(1) Make sure your plan is written and adequately addresses, as a minimum, all of the following:

- Preemergency planning and coordination with additional responders (including personnel from other employers such as: Fire departments, law enforcement agencies, emergency medical services, and state or federal agencies).
- Personnel roles, (See Table 1) and lines of authority and communications for all affected parties including responders
- Employee training (see WAC 296-824-30005 for more detail):

- Note:**
- Responders' level of training depends on the duties or roles the employer assigns.
  - Training for the employees' role should address the competencies specified in Tables 3 through 6.
  - Training on specific substances may be appropriate depending on the number and characteristics of hazardous substances expected to be encountered. For example, if employees may only respond to one substance, you could provide training (covering the knowledge and skills specified in Tables 3 through 6) on that single substance. If employees might respond to a range of hazardous substances, training may be required to cover categories of hazardous substances.
  - Videos and automated training methods (for example: Interactive computer-based programs) may be used in training; however, instructors must be readily available to:
    - Encourage and provide responses to questions for the benefit of the group.
    - Evaluate employee understanding of the material.
    - Provide other instructional interaction to the group.

- Emergency recognition
- Immediate emergency procedures including:
  - Methods of alerting employees (see WAC 296-800-310, exit routes and employee alarm systems) and outside responders
  - Procedures for limited action (emergency prevention)

**Note:** *Limited action* includes shutting down processes, closing emergency valves and other critical actions to secure the operation, or prevent the incident from increasing in severity.

<b>Limited Action and Employee Roles</b>	
<b>If . . .</b>	<b>Then employees involved would be:</b>
Limited action could be conducted in the danger area	Considered emergency responders
Limited action will not be conducted in the danger area	Considered evacuees, not emergency responders

- Details of who will evacuate immediately and who will remain behind for limited action
- Evacuation routes and procedures

- How to establish safe distances and places of refuge (for example, during emergency response the incident commander (IC) decides to make changes based on new developments, i.e., changes in the wind direction).
  - Methods of securing and controlling access to the site
  - Emergency medical treatment and first aid
  - A complete personal protective equipment (PPE) program that addresses:
    - Selection of PPE including selection criteria to be used and the identification, specified use and limitations of the PPE selected.
    - Training on proper use of PPE (including maintenance).
    - Hazards created by wearing PPE including heat stress during temperature extremes, and/or other appropriate medical considerations.
    - Criteria used for determining the proper fit of PPE.
    - Procedures covering proper use of PPE including procedures for inspection, putting it on (donning) and removing it (doffing).
    - Maintenance of PPE including procedures for decontamination, disposal and storage.
    - Methods used to evaluate the effectiveness of your PPE program.

**Note:**

- If a manufacturer's printed information or WISHA rule adequately addresses procedural requirements (such as donning or doffing for PPE), it is not necessary to rewrite this into your program; simply attach the printed information.
- You may use written procedures provided by the equipment manufacturer when they meet the requirements of other chapters, including chapter 296-842 WAC, Respirators.

- Emergency equipment
- Emergency response procedures
- Decontamination procedures determined by a hazardous materials specialist or other qualified individual
- Methods to critically assess the response and conduct appropriate follow-up

**You must:**

(2) Make your written emergency response plan available to employees, their representatives, and WISHA personnel for inspecting or copying.

**Note:** In situations where multiple employers could respond to an incident, all plans should consistently address:

- Who will be designated as the incident commander (IC)

**AND**

- If, when, and how transfer of the incident commander (IC) position will take place.

<b>Table 1 Roles and Duties of Emergency Responders</b>	
<b>If the employee's role is:</b>	<b>Then all of the following apply. They:</b>
First responder at the awareness level	<ul style="list-style-type: none"> <li>• Are likely to witness or discover a hazardous substance release</li> <li>• Are trained to initiate an emergency response by notifying the proper authorities of the release</li> <li>• Take no further action beyond notifying the authorities</li> </ul>
First responder at the operations level	<ul style="list-style-type: none"> <li>• Respond to actual or potential releases in order to protect nearby persons, property, and/or the environment from the effects of the release</li> <li>• Are trained to respond defensively, without trying to stop the release</li> <li>• May try to:                             <ul style="list-style-type: none"> <li>- Confine the release from a safe distance</li> <li>- Keep it from spreading</li> <li>- Protect others from hazardous exposures</li> </ul> </li> </ul>
Hazardous materials technician	<ul style="list-style-type: none"> <li>• Respond to releases or potential releases, with the intent of stopping the release</li> <li>• Are trained to approach the point of release offensively in order to, either:                             <ul style="list-style-type: none"> <li>- Plug</li> <li>- Patch</li> <li>- Stop the release using other methods</li> </ul> </li> </ul>
Hazardous materials specialist	<ul style="list-style-type: none"> <li>• Respond along with, and provide support to, hazardous materials technicians</li> <li>• Are required to have more specific knowledge of hazardous substances than a hazardous materials technician</li> <li>• Act as the site activity liaison when federal, state, local, and other government authorities participate</li> </ul>
Incident commander	<ul style="list-style-type: none"> <li>• Have ultimate responsibility for:                             <ul style="list-style-type: none"> <li>- Direction</li> <li>- Control</li> <li>- Coordination of the response effort</li> <li>- Will assume control of the incident beyond the first responder awareness level</li> </ul> </li> </ul>
Specialist employee	<ul style="list-style-type: none"> <li>• Are a technical, medical, environmental, or other type of expert</li> <li>• May represent a hazardous substance manufacturer, shipper, or a government agency</li> <li>• May be present at the scene or may assist from an off-site location</li> <li>• Regularly work with specific hazardous substances</li> <li>• Are trained in the hazards of specific substances</li> </ul>

<b>Table 1 Roles and Duties of Emergency Responders</b>	
<b>If the employee's role is:</b>	<b>Then all of the following apply. They:</b>
	<ul style="list-style-type: none"> <li>• Are expected to give technical advice or assistance to the incident commander or incident safety officer, when requested</li> </ul>
Skilled support personnel	<ul style="list-style-type: none"> <li>• Are needed to perform an immediate, specific emergency support task at the site</li> <li>• Are skilled in the operation of equipment including:                             <ul style="list-style-type: none"> <li>– Earth moving equipment</li> <li>– Cranes</li> <li>– Hoisting equipment</li> </ul> </li> </ul>
Incident safety officer	<ul style="list-style-type: none"> <li>• Are designated by the incident commander</li> <li>• Are knowledgeable in operations being implemented at the site</li> <li>• Have specific responsibility to:                             <ul style="list-style-type: none"> <li>– Identify and evaluate hazards</li> <li>– Provide direction on employee safety matters</li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-824-20005, filed 1/18/05, effective 3/1/05; 02-20-034, § 296-824-20005, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-300 Training.**

**Your responsibility:**

To make sure employees participating in emergency response operations are appropriately trained for their assigned roles and duties.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-300, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-30005 Train your employees.**

- Note:**
- Use Tables 3 through 6 to identify your employees' training competencies.
  - You may conduct training internally, or use outside training services to comply with this section.
    - When outside trainers are hired, you are still responsible for making sure the requirements of this section are met. For example, employers may compare the course outline to the competencies listed in Tables 3 through 6.

**You must:**

- Make sure employees are appropriately trained for their assigned roles and duties as follows:

EXEMPTION: Skilled support employees are not covered by the training requirements in this section. (See WAC 296-824-50015.)

**– Initial training:**

- Provide initial training before the employee is allowed to participate in an actual emergency response operation.

**Note:** When first responders at the awareness or operations level have sufficient experience to objectively demonstrate com-

petencies specified in Table 3, you may accept experience instead of training.

- Make sure initial training adequately addresses the competencies in Tables 3 through 6 and the minimum training durations in Table 2.

- Certify that employees objectively demonstrate competencies specified in Tables 3, 4 and 5 (except for employees trained as first responders at the awareness level).

**– Retraining (refresher) training:**

- Provide retraining annually
- Make sure retraining covers necessary content
- Document training or demonstrated competency

**Note:** Retraining is not required when employees demonstrate competencies annually and a record is kept of the demonstration methodology used.

**– Trainer qualifications:**

- Verify trainers have satisfactorily completed an instructors' training course for the subjects they teach. For example, courses offered by the United States National Academy, or equivalent courses are acceptable.

**OR**

- Have the educational and instructional experience necessary for training.

**– Specialist employees:**

- Specialist employees who have been sent to the scene to advise or assist must receive training or demonstrate competency in their specialty, annually.

<b>Table 2 Minimum Training Durations for All Responders</b>	
<b>If you are a:</b>	<b>Then:</b>
First responder at the awareness level	Training duration needs to be sufficient to provide the required competencies
First responder at the operations level	You need a minimum of 8 hours training (see Table 3)
Hazardous materials technician	You need a minimum of 24 hours training (see Table 4)
Hazardous materials specialist	You need a minimum of 24 hours training (see Table 4)
Incident commander	You need a minimum of 24 hours training (see Table 5)

<b>Table 3 Competencies for First Responders at the Awareness Level and Operations Level</b>		
Employees must be able to show they:	When they are designated as First Responders at the:	
	Awareness Level	Operations Level
Understand what hazardous substances are and their associated risks.	X	X
Recognize the presence of hazardous substances in an emergency.	X	X

<b>Table 3</b>		
<b>Competencies for First Responders at the Awareness Level and Operations Level</b>		
Can identify the hazardous substances, when possible.	X	X
Understand the potential consequences of hazardous substances in an emergency.	X	X
Understand the role of a first responder at the awareness level as described in: <ul style="list-style-type: none"> <li>• The employer's emergency response plan, including site security and control.</li> <li>• The United States Department of Transportation's Emergency Response Guidebook. (<i>search at: <a href="http://www.dot.gov">http://www.dot.gov</a></i>).</li> </ul>	X	X
Can use The United States Department of Transportation's Emergency Response Guidebook.	X	X
Recognize the need for additional resources and the need to notify the incident's communication center accordingly.	X	X
Know basic hazard and risk assessment techniques.		X
Can select and use personal protective equipment (PPE) appropriate for first responder operations level.		X
Understand basic hazardous materials terms.		X
Can perform basic control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can implement decontamination procedures to their level training.		X
Understand relevant standard operating and termination procedures.		X

<b>Table 4</b>		
<b>Competencies for Hazardous Materials Technicians and Hazardous Materials Specialist</b>		
Employees must be able to show they:	When they are designated as a Hazardous Materials:	
	Technician	Specialist
Have the competencies specified for the first responder operations level. (See Table 3)	X	X
Can implement an employer's emergency response plan.	X	X
Can function within their assigned role in the incident command system.	X	X
Understand hazard and risk assessment techniques.	X	X
Understand basic chemical and toxicological terminology and behavior.	X	X
Can use field survey instruments and equipment to classify, identify, and verify materials at the incident.	X	X
Can select and use personal protective equipment (PPE) appropriate for hazardous materials technicians.	X	X
Can perform advance control, containment, and/or confinement operations within the capabilities of the resources and PPE available.	X	X
Can implement decontamination procedures to their level of training.	X	X
Understand termination procedures.	X	X
Can implement the local emergency response plan.		X
Know of the state emergency response plan.		X
Can develop a site safety and control plan.		X
Understand chemical, radiological, and toxicological terminology and behavior.		X
Understand in-depth hazard and risk techniques.		X
Can use advanced survey instruments and equipment to classify, identify and verify materials at the incident.		X
Can select and use proper specialized chemical PPE given to hazardous materials specialists.		X
Can perform specialized control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can determine decontamination procedures.		X

<b>Table 5</b>	
<b>Competencies for Incident Commanders</b>	
Employees designated as Incident Commanders must be able to show they: <ul style="list-style-type: none"> <li>• Have competencies specified for the First Responder Operations Level. (See Table 3.)</li> </ul>	

<b>Table 5</b>	
<b>Competencies for Incident Commanders</b>	
	• Know of the state emergency response plan and the Federal Regional Response Team.
	• Can implement the local emergency response plan.
	• Can implement the employer's emergency response plan.
	• Have knowledge of the incident command system (ICS) and understand how they relate to it.
	• Can implement the employer's ICS.
	• Understand the hazards and risks associated with employees working in chemical protective clothing.
	• Understand the importance of decontamination procedures.
<b>Note:</b>	If the first employee arriving at the scene is not trained as an IC, they may take control of the incident within their designated role and training level.

<b>Table 6</b>	
<b>Competencies for Specialist Employees</b>	
Employees designated as Specialist Employees must be able to show they:	
	• Have current knowledge in their field regarding safety and health practices relating to the specific hazardous substances.
	• Have the knowledge of the ICS and understand how they relate to it.
	• Understand the care and use of personal protective equipment (PPE).

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-30005, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-400 Medical surveillance.** Summary.

**Your responsibility:**

To provide and document medical surveillance for your employees.

**You must:**

Provide medical surveillance to employees

WAC 296-824-40005

Keep records

WAC 296-824-40010.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-400, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-40005 Provide medical surveillance to employees.**

**You must:**

(1) Provide medical surveillance for employees to comply with Tables 7 and 8, and the following:

- Make medical surveillance available at:

- Reasonable times and places.

- No cost to employees, including travel associated costs such as mileage, gas or bus fare if the employee is required to travel off site

**AND**

- Wages for additional time spent outside of employees normal work hours.

- Make sure a licensed physician performs or supervises exams and procedures.

- Give complete information to the examining physician including:

- A copy of this chapter.

- A description of the employee's duties that relate to hazardous substance exposure.

- The hazardous substance exposure levels anticipated for the employee.

- A description of the personal protective equipment (PPE) the employee could use.

- Information available from previous medical examinations.

- The medical evaluation information required by chapter 296-842 WAC, Respirators.

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- Medical exams must include, at a minimum:

- A medical history

- A work history (or updated history if on file)

- A special emphasis on:

- Assessment of symptoms related to handling hazardous substances

- Health hazards

- Evaluation of fitness for duty (including the ability to wear any personal protective equipment (PPE) or other conditions that may be expected at the workplace)

- Other content as determined by the examining physician.

**Note:**

The physician should consult the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* and the *Medical Management Guidelines for Acute Chemical Exposure* (search OSHA web site: <http://www.osha.gov>).

(2) Obtain the physician's written opinion and give a copy to the employee that includes:

- A statement of whether or not medical conditions were found which would increase the employee's risk for impairment during emergency response work or respirator use.

- Do not include specific findings or diagnoses unrelated to occupational exposures.

- Limitations recommended to the employee's assigned work, if any.

- Exam and test results if the employee requests this information.

- A statement that affirms the employee has been confidentially informed of medical exam results (including medical conditions requiring follow-up).

<b>Table 7 Medical Surveillance for Employee Categories</b>	
<b>If the employee is covered by this chapter and is:</b>	<b>Then you must:</b>
<ul style="list-style-type: none"> <li>• Exposed for at least 30 days a year to health hazards or hazardous substances at or above the permissible exposure limit or published exposure levels (even when respirators are used),</li> <li><b>OR</b></li> <li>• Required to wear a respirator for at least 30 days a year.*</li> </ul>	<ul style="list-style-type: none"> <li>• Offer standard medical surveillance as specified in Table 8.*</li> </ul>
<ul style="list-style-type: none"> <li>• A hazardous materials (HAZMAT) team member</li> <li>• A hazardous materials specialist</li> </ul>	<ul style="list-style-type: none"> <li>• Provide standard medical surveillance as specified in Table 8.</li> </ul>
<ul style="list-style-type: none"> <li>• An emergency responder who shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances during an incident.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide incident-specific medical surveillance as specified in Table 8.</li> </ul>
<ul style="list-style-type: none"> <li>• Not an emergency responder and:                             <ul style="list-style-type: none"> <li>– May be injured</li> <li>– Shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances</li> <li>– May have been exposed to hazardous substances at concentrations above the permissible exposure limits (PELs) or the published exposure levels without appropriate PPE.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Offer incident-specific medical surveillance as specified in Table 8.</li> </ul>

**\*Note:** A medical evaluation for respirator use is required by chapter 296-842 WAC, Respirators, for those employees who have not been cleared for respirator use during medical surveillance activities.

<b>Table 8 Frequency of Exams and Consultations</b>	
<b>If the employee is covered by:</b>	<b>Then medical surveillance must include:</b>
<ul style="list-style-type: none"> <li>• Standard medical surveillance</li> </ul>	<ul style="list-style-type: none"> <li>• Exams and consultations:                             <ul style="list-style-type: none"> <li>– Before assignment.</li> <li><b>Note:</b> If the employee is a hazardous materials (HAZMAT) team member or a hazardous materials specialist, the employee must receive a baseline physical examination.</li> <li>– At least once every 12 months after their initial assignment unless the physician believes a shorter, or longer interval (but no more than 24 months) is appropriate.</li> <li>– Whenever employees are reassigned to an area where they will no longer be covered by medical surveillance and they have not been examined within the past 6 months.</li> <li>– As soon as possible after an employee reports:                                     <ul style="list-style-type: none"> <li>◆ Signs or symptoms of possible overexposure to hazardous substances or health hazards</li> <li>◆ Injury</li> <li>◆ Exposure above the permissible exposure limits or published exposure levels</li> </ul> </li> <li>– At the termination of their employment unless they were examined within the past 6 months.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Incident-specific medical surveillance</li> </ul>	<ul style="list-style-type: none"> <li>• Medical consultations and exams:                             <ul style="list-style-type: none"> <li>– As soon as possible following the incident or development of signs or symptoms.</li> <li>– At additional times, if the physician determines follow-up is medically necessary.</li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-824-40005, filed 1/18/05, effective 3/1/05; 02-20-034, § 296-824-40005, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-40010 Keep records.**

**You must:**

- Keep a record of:
  - Name and Social Security number of the employee receiving medical surveillance
  - Physicians' written opinions, recommended limitations, and results of examinations and tests

- Any employee medical complaints regarding hazardous substance exposures
- A copy of all information given to the examining physician (except a copy of this chapter)

**Note:** Keep records meeting the criteria specified in chapter 296-62 WAC, Part B, Access to records, for the length of time specified in that chapter.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-40010, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-500 Incident requirements. Summary.**

**Your responsibility:**

To conduct and manage emergency response operations so employees are protected from hazardous substances and conditions.

**You must:**

Recognize emergencies and initiate a response

WAC 296-824-50005

Implement and maintain an incident command system (ICS)

WAC 296-824-50010

Prepare skilled support personnel

WAC 296-824-50015

Make sure the incident commander oversees activities during the response

WAC 296-824-50020

Use the buddy system in danger areas

WAC 296-824-50025

Provide rescue and medical assistance

WAC 296-824-50030.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-500, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-50005 Recognize emergencies and initiate a response.**

**You must:**

• Make sure employees follow procedures in your emergency response plan to:

– Recognize when an emergency response must be initiated

– Notify employees, and others designated in your plan, of the release

– Follow immediate emergency procedures

– Prevent the incident from increasing in severity or to secure the operation.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-50005, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-50010 Implement and maintain an incident command system (ICS).**

**You must:**

(1) Make sure a single individual, acting as the incident commander (IC), is in charge of the site-specific incident command system (ICS) and acts within their designated role and training level.

**Note:**

- For multiemployer worksites:
  - The IC has responsibility for controlling emergency response operations at the site for all employers.
  - Emergency response plans should be consistent in designating who assumes the IC position.

- If the first employee arriving at the scene is not trained as an IC (see Table 5, Competencies for Incident Commanders, WAC 296-824-30005), they may take control of the incident within their designated role and training level.

(2) Make sure all employers' emergency responders and their communications are coordinated and controlled by the IC.

**Note:** The IC may delegate tasks to subordinates (within their training level).

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(3) Make sure each employer at the scene has designated a representative to assist the IC.

(4) Establish security and control of the site as specified in your written emergency response plan.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-50010, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-50015 Prepare skilled support personnel.**

**Note:** The duties of skilled support personnel are described in Table 1, Roles and Duties of Emergency Responders.

**You must:**

(1) Make sure that your skilled support personnel (including those employees who are not regularly employed by you) who could be exposed to on-scene hazards are given an initial briefing at the site before they participate in any emergency response. The initial briefing must include:

- What chemical hazards are involved
- What duties are to be performed
- Instruction in the wearing of appropriate personal protective equipment

**Note:** Skilled support personnel do not need to comply with the other training requirements of this chapter.

(2) Make sure the safety and health precautions given to your employees are also given to skilled support personnel.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-50015, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-50020 Make sure the incident commander oversees activities during the response.**

**The employer of the incident commander (IC) must:**

(1) Identify all hazardous substances and conditions present, within their training level, using site analysis and maximum exposure limits, when appropriate.

(2) Implement emergency response procedures appropriate to the hazardous substances and conditions present, such as:

- Procedures that address the use of engineering controls, hazardous substance handling, and new technologies
- Procedures that address decontamination
- Procedures that address PPE
- Procedures that limit the number of personnel to those who are actively performing emergency response operations, in areas where exposure could exist.

(3) Designate an incident safety officer (ISO).

• Make sure the ISO demonstrates knowledge about operations being implemented at the emergency response site. They must:

– Identify and evaluate hazards

– Communicate with the IC about hazards, immediately informing the IC of corrective actions that must be taken when conditions are judged to be:

◆ An imminent danger

**OR**

◆ Immediately dangerous to life or health (IDLH).

– Provide direction about the safety of operations.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-50020, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-50025 Use the buddy system in danger areas.**

**You must:**

- Make sure operations and tasks (including limited actions) in danger areas are conducted using the buddy system in teams of two or more.

**Definition:**

Danger areas are areas where conditions pose a serious danger to employees, such as areas where:

- Immediately dangerous to life or health (IDLH) conditions could exist.

**OR**

- High levels of exposure to toxic substances could exist.

**OR**

- There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a hazardous substance.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-50025, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-50030 Provide rescue and medical assistance.**

**You must:**

(1) Provide stand-by employees equipped with the same level of personal protective equipment (PPE) as the entrants, for assistance or rescue.

**Note:**

- The buddy system applies to stand-by employees (see WAC 296-824-50025).
- One of the two stand-by employees can be assigned to another task provided it does not interfere with the performance of the stand-by role.
- Rescue equipment should be selected and provided based on the types of rescue situations that could occur.

**You must:**

(2) Make sure employees trained in first aid are readily available with necessary medical equipment and have a way to transport the injured.

**Note:**

- Employee training is covered by WAC 296-800-150, first aid. This rule requires training on the eighteen subjects listed in addition to any subjects that are specific to your workplace emergency hazards (for example: If exposure to corrosive substances could occur, training would need to include first-aid procedures for treating chemical burns).
- Employers who designate and train their employees to provide first aid are covered by chapter 296-823 WAC, Occupational exposure to bloodborne pathogens.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-09-110, § 296-824-50030, filed 4/22/03, effective 8/1/03. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-50030, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-600 Personal protective equipment. Summary.**

**Your responsibility:**

To provide appropriate personal protective equipment (PPE) and make sure it is used properly.

**You must:**

Use appropriate personal protective equipment

WAC 296-824-60005

Control hazards created by PPE

WAC 296-824-60010

Use PPE properly

WAC 296-824-60015.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-600, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-60005 Personal protective equipment. Use appropriate personal protective equipment (PPE).**

**Note:**

- Only properly trained employees should select PPE. Hazardous materials technicians and hazardous materials specialists can select PPE within the competencies specified in Table 4.
- Selection requirements in other PPE rules also apply, including:
  - WAC 296-800-160, Personal protective equipment.
  - Chapter 296-842 WAC, Respirators.
  - WAC 296-24-58505, Fire brigades.
  - Chapter 296-305 WAC, Safety standards for fire fighting.

**You must:**

- Provide employees with appropriate PPE and make sure it is used if hazards could be present.

- Select PPE (such as respirators, gloves, protective suits and other PPE) based on:

- ◆ An evaluation of the performance characteristics (such as breakthrough time and hazardous substance-specificity of the material or item) relevant to the requirements and limitations of the site.

- ◆ Task-specific conditions and durations.

- ◆ The hazards and potential hazards of the site (see Table 9, Selecting PPE for Specific Hazards).

- Select totally encapsulating chemical protective (TECP) suits, as specified in Table 9, that:

- ◆ Maintain positive air pressure.

- ◆ Prevent inward test gas leakage of more than 0.5 percent.

**Note:** Follow the manufacturer's recommended procedure for testing a TECP suit's ability to maintain positive air pressure and prevent inward gas leakage. Other established test protocols for these suits, for example NFPA 1991 and ASTM F1052-97, may also be used.

**Table 9  
Selecting PPE for Specific Hazards**

<b>If:</b>	<b>Then:</b>
<ul style="list-style-type: none"> <li>• Inhalation hazards could be present.</li> </ul>	<ul style="list-style-type: none"> <li>• Positive-pressure (pressure-demand) self-contained breathing apparatus (SCBA)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• A decreased level of respiratory protection only when the incident commander determines, from air monitoring results, that employees will be adequately protected.</li> </ul>
Chemical exposure levels will create a substantial possibility of: <ul style="list-style-type: none"> <li>• Immediate death.</li> <li>• Immediate serious illness or injury.</li> <li>• Reduced ability to escape.</li> </ul>	Either positive-pressure (pressure-demand): <ul style="list-style-type: none"> <li>• SCBA</li> <li>• Air-line respirators equipped with an escape air supply.</li> </ul>

<b>Table 9 Selecting PPE for Specific Hazards</b>	
<b>If:</b>	<b>Then:</b>
Skin absorption of a hazardous substance may result in a substantial possibility of: <ul style="list-style-type: none"> <li>• Immediate death.</li> <li>• Immediate serious illness or injury.</li> <li>• Reduced ability to escape.</li> </ul>	Protection equivalent to Level A including a totally encapsulating chemical protective (TECP) suit.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-824-60005, filed 1/18/05, effective 3/1/05; 02-20-034, § 296-824-60005, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-60010 Control hazards created by personal protective equipment (PPE).**

**You must:**

- Control hazards created by the use of PPE, including:
  - Heat stress due to extremely high temperatures.
  - Any other employee health hazard and consideration.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-60010, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-60015 Use personal protective equipment (PPE) properly.**

**You must:**

- (1) Make sure employees inspect PPE before, during and after use, following your plan's procedures.
- (2) Make sure employees put on (don) and remove (doff) PPE following your plan's procedures.
- (3) Make sure employees do not interchange self-contained breathing apparatus (SCBA) air cylinders from different manufacturers, unless all of the following apply:
  - There is a life-saving emergency
  - You need a supplemental air supply
  - The cylinders are of the same capacity and pressure rating.
- (4) Make sure compressed air cylinders used with SCBAs meet the testing and service life requirements of the United States Department of Transportation (USDOT). Search at: <http://www.dot.gov>.

**Note:** You can also check with the cylinder manufacturers to obtain USDOT test and service life specifications.

**You must:**

- (5) Make sure PPE is maintained in a safe and reliable condition using your plan's procedures.
  - PPE maintenance includes:
    - Decontamination

- Cleaning
- Inspection
- Identification of damage or defects
- Parts repair or replacement
- Storage or disposal.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-60015, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-700 Postemergency response.**

**Your responsibility:**

To protect employees during postemergency response activities by following appropriate work practices, training and other requirements.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-20-034, § 296-824-700, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-70005 Follow the appropriate postemergency response requirements.**

**Important:**

• Postemergency response is the stage of the emergency response where the immediate threat from the release has been stabilized or eliminated, and cleanup of the site has started.

• When cleanup is done by the employees who were part of the initial emergency response, the employees are not covered by this section (however, training, PPE and other requirements in WAC 296-824-20005 through 296-824-60015 apply to these employees).

**You must:**

- (1) Follow Table 10 to determine which requirements apply to your postemergency response activities.
- (2) Maintain clean-up equipment as specified in Table 10.

<b>Table 10 Rules that Apply to Postemergency Response Activities</b>	
<b>When postemergency response cleanup is performed by employees who were not part of the initial emergency response and:</b>	<b>The following rules or requirements apply:</b>
It is necessary to remove hazardous substances, health hazards and contaminated materials (example: Soil) from the site	Chapter 296-62 WAC, Part P, Hazardous waste operations and treatment, storage and disposal facilities.
Cleanup is done on plant property using plant or workplace employees <b>AND</b> It is not necessary to remove hazardous substances, health hazards and contaminated materials from the site.	For training: <ul style="list-style-type: none"> <li>• WAC 296-24-567(1), Employee emergency action plans</li> <li>• Chapter 296-842 WAC, Respirators</li> <li>• WAC 296-800-170, Employer chemical hazard communication</li> </ul>

<b>Table 10</b>	
<b>Rules that Apply to Postemergency Response Activities</b>	
<b>When postemergency response cleanup is performed by employees who were not part of the initial emergency response and:</b>	
	<p><b>The following rules or requirements apply:</b></p> <ul style="list-style-type: none"> <li>• Other appropriate training requirements relevant to personal protective equipment (PPE) and decontamination</li> </ul> <p>For equipment:</p> <ul style="list-style-type: none"> <li>• Make sure that all equipment used for clean-up work is serviced and inspected before use.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-824-70005, filed 1/18/05, effective 3/1/05; 02-20-034, § 296-824-70005, filed 9/24/02, effective 10/1/02.]

**WAC 296-824-800 Definitions.** The following definitions are specific to this chapter:

**Annually**

Any twelve-month cycle.

**Buddy system**

A system of organizing employees (who enter or stand by danger areas) into work groups, so each employee can be observed by at least one other member of the group. The purpose of this system is to provide rapid assistance to employees in an emergency.

**Clean-up operation(s)**

An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared up or, in any other manner, processed or handled with the goal of making the site safer for people or the environment.

**Danger area**

Areas where conditions pose a serious danger to employees, such as areas where:

- Immediately dangerous to life or health (IDLH) conditions could exist

**OR**

- High levels of exposure to toxic substances could exist

**OR**

- There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

**Decontamination**

Removing hazardous substances from employees and their equipment so potential adverse health effects will not occur.

**Emergency response**

An organized response to an anticipated release of a hazardous substance that is, or could become an uncontrolled release.

**Emergency response plan**

A written plan that requires coordination between emergency response participants, and contains procedures, criteria, and other information that will be applied to emergency response operations. Each employer's plan should be compatible with local and state plans.

**Engineering controls**

Methods of controlling employee exposures by modifying the source or reducing the quantity of contaminants.

**Hazardous materials team (HAZMAT team)**

A group of employees who are expected to perform responses to releases, or possible releases, of hazardous substances for the purpose of control and stabilization. As a

result of their duties, HAZMAT team members may have close contact with hazardous substances.

**Note:** A HAZMAT team may be a separate component of a fire brigade or fire department.

**Hazardous substance**

Any of the following substances that could adversely affect an exposed employee's health or safety:

- Substances defined under section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) or "Superfund" Act (visit: <http://www.epa.gov>)

- Biological or other disease-causing agents released that could reasonably be expected to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in a person or their offspring when the person:

- Is directly exposed to the agent in the environment

- Directly ingests, inhales, or assimilates the agent from the environment

- Indirectly ingests the agent through a food chain

- Substances listed by the United States Department of Transportation as hazardous materials under Title 49 (Transportation) in the Code of Federal Regulations (CFR), Part 172, section 101 and appendices (visit: <http://www.nara.gov> and search for "List of CFR subjects")

- Hazardous wastes as defined in this chapter.

**Hazardous waste**

A substance designated by chapter 173-303 WAC, Dangerous waste regulations, department of ecology, as a dangerous waste or an extremely hazardous waste and any waste fitting the definition of "health hazard" in this chapter.

**Note:** For department of ecology regulations, visit: <http://www.ecy.wa.gov>

**Health hazard**

A chemical, a mixture of chemicals, or a pathogen for which there is statistically significant evidence, based on at least one study conducted according to established scientific principles, that acute or chronic health effects may occur in exposed employees.

The term "health hazard" includes stress due to temperature extremes and chemicals that are:

- Carcinogens

- Toxic or highly toxic agents

- Reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, or neurotoxins

- Agents acting on the hematopoietic system agents that damage lungs, skin, eyes, or mucous membranes. (Detailed definitions of these chemical terms can be found in the Safety and health core rules, WAC 296-800-170, chemical hazard communication.)

#### **Incident command system (ICS)**

An organized approach to control and manage operations at an emergency response incident.

#### **Incidental release**

A release that can be safely controlled at the time of the release and does not have the potential to become an uncontrolled release.

Note:

Example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

#### **Immediately dangerous to life or health (IDLH)**

Any atmospheric condition that would:

- Cause an immediate threat to life

OR

- Cause permanent or delayed adverse health effects

OR

- Interfere with an employee's ability to escape

#### **Limited action**

Action necessary to:

- Secure an operation during emergency responses,

OR

- Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

#### **Lines of authority**

A preestablished ranking of individuals, qualified to assume a commanding role during an emergency response, noted in an emergency response plan and implemented during a response. This is most important when responders from multiple employers could participate in an emergency response.

#### **Lower explosive limit (LEL)**

See lower flammable limit (LFL).

#### **Lower Flammable limit (LFL)**

The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent (by volume) of the material in air (or other oxidant).

#### **Must**

Must means mandatory.

#### **Permissible exposure limit (PEL)**

Means the established time-weighted-average (TWA) concentration or ceiling concentration of a contaminant that must not be exceeded. The exposure, inhalation, or dermal permissible limit specified in chapter 296-841 WAC, identifying and controlling respiratory hazards.

(2007 Ed.)

#### **Personal protective equipment (PPE)**

Protective items designed to be worn by the user to protect them against airborne, skin contact and other hazards. This includes items such as respiratory protection, protective suits, gloves, eye protection, etc.

#### **Postemergency response**

The stage of the emergency response where the immediate threat from the release has been stabilized or eliminated, and cleanup of the site has started.

#### **Published exposure level**

Exposure limits published in "*National Institute for Occupational Safety and Health (NIOSH) Recommendations for Occupational Safety and Health*" (DHHS publication #92-100, 1992).

If an exposure limit is not published by NIOSH, then "published exposure level" means the exposure limits published by the American Conference of Governmental Industrial Hygienists (ACGIH) in "*TLVs and BEIs-Threshold Limit Values for Chemical Substances and Physical Agents*" (1999 edition).

**Note:** Additional exposure levels published by recognized organizations such as the American Industrial Hygiene Association are not required to be observed by this rule; however, they may be a useful resource when a hazardous substance is not covered by NIOSH and ACGIH publications.

#### **Release**

A spill, leak, or other type of hazardous substance discharge.

#### **Uncontrolled release**

A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

Examples of conditions that could create a significant safety and health risk:

- Large-quantity releases
- Small releases that could be highly toxic
- Potentially contaminated individuals arriving at hospitals
- Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

#### **Workplace**

- A fixed facility
- OR
- A temporary location (such as a traffic corridor)
- OR

- Locations where employees respond to emergencies.

**You**

The employer. For a complete definition of "employer" see Safety and health core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-824-800, filed 1/18/05, effective 3/1/05; 02-20-034, § 296-824-800, filed 9/24/02, effective 10/1/02.]

## Chapter 296-826 WAC ANHYDROUS AMMONIA

**WAC**

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296-826-60005	Mounting containers on trucks, semi-trailers and trailers.
296-826-60010	Mounting containers on farm trucks or trailers for transporting ammonia.
296-826-60015	Tank car loading or unloading.

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296-826-60020	General specifications.
296-826-60025	Additional requirements for systems mounted on trucks, semi-trailers, and trailers for transporting ammonia.

**FILLING DENSITIES**

296-826-60030	Nonrefrigerated containers.
296-826-60035	Refrigerated tanks.
296-826-60040	Welding.
296-826-900	Definitions.

**WAC 296-826-100 Scope.** This chapter applies to employers who use, handle, store, distribute, or transport anhydrous ammonia.

• Operations covered by this chapter include, but are not limited to:

– All distributors of anhydrous ammonia, including distributors who store and transport anhydrous ammonia on trucks delivering to a farm.

– Any employer who stores and handles anhydrous ammonia to use in water treatment plants, acid production, metal processing, pollution control, or make products such as:

- Fertilizers
- Synthetic resins
- Plastics and intermediates
- Hexamine for explosives
- Dyes
- Insecticides

• Operations not covered by this chapter include:

– The manufacture of anhydrous ammonia.

– Mechanical refrigeration systems where ammonia is used solely as a refrigerant.

– Pipelines transporting anhydrous ammonia into or out of a storage facility.

– Agricultural operations within the scope of chapter 296-307 WAC. When a distributor delivers anhydrous ammonia to a farmer, the requirements for agricultural operations apply:

■ As soon as the farmer takes possession of the truck or equipment containing ammonia from the distributor, this includes the farmer picking up the farm truck or equipment from the distributor.

■ An ammonia distributor begins performing agricultural operations using their ammonia at the farm.

**References:** • For requirements on agricultural operations using anhydrous ammonia, go to Part U-1 of chapter 296-307 WAC.

• If you use, handle, store, distribute, or transport anhydrous ammonia in quantities of 10,000 pounds or more, follow the requirements found in another chapter, Process safety management of highly hazardous chemicals, chapter 296-67 WAC.

• To protect employees handling ammonia, in addition to this chapter, you will need the following requirements found in other chapters:

– The following sections from the Safety and health core rules, chapter 296-800 WAC:

- Accident prevention program, WAC 296-800-140
- Emergency washing, WAC 296-800-150
- Personal protective equipment, WAC 296-800-160
- Emergency response, chapter 296-824 WAC
- Respiratory hazards, chapter 296-841 WAC
- Respirators, chapter 296-842 WAC

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-10-067, § 296-826-100, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-200 Employee safety.****Your responsibility:**

To protect employees who use, handle, store, distribute, or transport anhydrous ammonia.

## Personal protective equipment (PPE)

WAC 296-826-20005

## Training

WAC 296-826-20010

## Chemical reactions

WAC 296-826-20015

## Emergencies

WAC 296-826-20020

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-200, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-20005 Personal protective equipment (PPE).****You must:**

• Provide the following PPE at all stationary storage installations:

– Two respirators in readily accessible locations as required by WAC 296-842, Respirators

– One pair of protective gloves, boots, pants, a protective slicker, and a jacket made of:

■ Rubber;

**OR**

■ Other material that can not be penetrated by ammonia.

– Tight fitting vented goggles and one full face shield.

– An easily accessible shower or fifty gallons of clean water in an open top container.

• Equip tank motor vehicles with all of the following equipment for emergency purposes:

– At least five gallons of water to flush liquid ammonia from skin or eyes.

– Respiratory equipment suitable for anhydrous ammonia as required by chapter 296-842 WAC, Respirators

– A pair of protective gloves made of neoprene rubber or other material that cannot be penetrated by ammonia.

– Tight fitting goggles and a full face shield

**Note:** Additional safety equipment is recommended when more than one employee is present.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-20005, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-20010 Training.****You must:**

• Train employees who handle ammonia on all of the following:

– Safe operating practices

– Emergency procedures

– Proper use of personal protective equipment (PPE)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-20010, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-20015 Chemical reactions.****You must:**

• Prohibit the use of ammonia with other chemicals unless the possible reactions have been adequately investigated.

**Note:** • Under some circumstances, ammonia and ammonium compounds can form explosive products with other chemicals. For additional information, refer to the following:  
– Section 491M "Manual on Hazardous Chemical Reactions" of the NFPA, 1969 Edition;  
**AND**

– CG-388, the "Chemical Data Guide for Bulk Shipment by Water," 1969

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-20015, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-20020 Emergencies.****You must:**

• Make sure only trained personnel designated to respond if a leak occurs in an ammonia system do all of the following:

– Evacuate affected personnel to noncontaminated areas

– Shut off appropriate valves

– Put on all of the following PPE in concentrated ammonia atmospheres and in unknown concentrations of ammonia:

■ Self-contained breathing apparatus (SCBA)

■ A plastic or rubber suit

■ Gauntlet-type plastic or rubber gloves

• Make sure a physician treats all employees with eye injuries caused by liquid ammonia. In addition:

– Immediately flush liquid ammonia from skin or eyes continuously for a minimum of fifteen minutes using water or eye wash solutions as required by the safety and health core rules; First aid, WAC 296-800-150.

– Do not use neutralizing solutions or ointments on affected areas.

**Note:** • Drivers unable to stop a leak during transport should:  
– Move the vehicle to an isolated area  
– Use the current *Department of Transportation (DOT) Emergency Response Guidebook* to establish safe distances to isolate a leaking tank from the driver and the public.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-20020, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-300 Design, construction and installation.****Your responsibility:**

To make sure containers and tanks used for storing, distributing, or transporting anhydrous ammonia meet design, construction and installation requirements.

## Container location and marking

General specifications

WAC 296-826-30005

Specifications for portable DOT containers

WAC 296-826-30010

Nonrefrigerated stationary containers

WAC 296-826-30015

Refrigerated storage

WAC 296-826-30020

Systems mounted on trucks, semi-trailers, and trailers

WAC 296-826-30025

Systems mounted on farm trucks or trailers for transporting ammonia

WAC 296-826-30030

Systems mounted on farm equipment for ammonia application

WAC 296-826-30035

DOT containers

WAC 296-826-30040

Nonrefrigerated containers

Installation

WAC 296-826-30045

Reinstallation

WAC 296-826-30050  
 Refrigerated tanks  
 Installation  
 WAC 296-826-30055  
 Reinstallation  
 WAC 296-826-30060

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-300, filed 5/2/06, effective 9/1/06.]

**CONTAINER LOCATION AND MARKING**

**WAC 296-826-30005 General specifications.**

**You must:**

- Locate containers either:
  - In buildings or parts of the building provided for ammonia storage;
- OR**
- Outside, away from densely populated areas.
- Locate containers according to Table 1, Minimum Distances for Container Location.

Table 1  
 Minimum Distances for Container Location

Nominal Capacity of Container	Minimum Distances (feet) from Container to:		
	Line of Adjoining Property Which may be Built upon, Highways & Main-line of Railroad	Place of Public Assembly	Institution Occupancy
Over 500 to 2,000	25	150	250
Over 2,000 to 30,000	50	300	500
Over 30,000 to 100,000	50	450	750
Over 100,000	50	600	1,000

**You must:**

- Make sure containers are located to meet all of the following:
  - Away from readily ignitable materials such as weeds, long dry grass, and waste.
  - So there is no adverse impact on employee health through unnecessary exposure.
  - At least fifty feet away from dug wells and other sources of potable water.
- If the container is a part of a water treatment installation, then this requirement does not apply.
- Maintain legibility of all container and valve markings.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30005, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30010 Specifications for portable DOT containers.**

**IMPORTANT:**

This section applies to systems that use cylinders, portable tanks (DOT-51), or "ton containers" (DOT-106A, DOT-110A), constructed according to DOT specifications.

**You must:**

- Locate containers aboveground, never buried below the ground.
- Put containers on firm ground or secure them.
- Guard against settling on the outlet piping by using a flexible connection or a special fitting.
- Protect containers from all of the following:

- Ignitable debris
- External damage including corrosion
- Heat sources, like radiant flames and steam pipes
- Moving vehicles.
- Prohibit the use of heat to raise the container pressure.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30010, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30015 Nonrefrigerated stationary containers.**

**You must:**

- Construct and test containers according to the Unfired Pressure Vessel Code.
- Make sure the minimum design pressure of the container is 250 psig
- Make sure all containers with a capacity exceeding two hundred fifty gallons are constructed to meet one or more of the following:
  - Stress relieved after fabrication according to the Unfired Pressure Vessel Code
  - Have stress relieved cold-formed heads
  - Hot-formed heads

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30015, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30020 Refrigerated storage.**

**You must:**

- Make sure the minimum design temperature is the same as the refrigerated temperature of the tank.
- Construct and test containers, with a design pressure exceeding 15 psig, according to the Unfired Pressure Vessel Code.
  - Select construction materials from those listed from *API Standard 620, 4th Edition 2002, Recommended Rules for Design and Construction of Large, Welded Low Pressure Storage Tanks.*
  - Construct tanks with a design pressure with 15 psig or less according to API Standard 620, 4th Edition, 2002.
  - Use ASME Code as a guide in the selection of austenitic steels or nonferrous materials, if used at the design temperature.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30020, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30025 Systems mounted on trucks, semi-trailers, and trailers.**

**You must:**

- Construct and test containers, when transported within the state of Washington, according to both of the following:
  - A minimum design pressure of 250 psig
  - The Unfired Pressure Vessel Code.
- Construct containers used for interstate transport according to DOT regulations.
  - Make sure the shell or head thickness of any container is at least 3/16 of an inch.
  - Make sure electrical lighting circuits meet all of the following:
    - Have suitable over-current protection, such as fuses or automatic circuit breakers.

- Are suitably secured, insulated, and protected against physical damage.
- Have wiring with sufficient carrying capacity and mechanical strength.
  - Use only electric light.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30025, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30030 Systems mounted on farm trucks or trailers for transporting ammonia.**

**You must:**

- Construct and test containers, with a design pressure exceeding 15 psig, according to the Unfired Pressure Vessel Code.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30030, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30035 Systems mounted on farm equipment for ammonia application.**

**You must:**

- Construct and test containers according to the Unfired Pressure Vessel Code.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30035, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30040 DOT containers.**

**You must:**

- Make sure containers meet DOT specifications.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30040, filed 5/2/06, effective 9/1/06.]

**NONREFRIGERATED CONTAINERS**

**WAC 296-826-30045 Installation.**

**You must:**

- Provide a minimum distance of five feet between aboveground and underground containers that have more than a twelve hundred gallon capacity each.
  - Protect containers from floating away, in areas with a potential for high flood waters, by providing either:
    - Secure anchorage;
- OR**
- Adequate pier height.
- Follow Table 2 for aboveground, nonrefrigerated containers.

Table 2  
Aboveground Nonrefrigerated Container Requirements

If you have:	Then:
Aboveground containers	Provide one of the following: <ul style="list-style-type: none"> <li>- Substantial reinforced concrete footings and foundations</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>- Structural steel supports mounted on reinforced concrete foundations.</li> </ul> Make sure the reinforced concrete foundation meets all of the following:

If you have:	Then:
	<ul style="list-style-type: none"> <li>- Extends below the established frost line</li> <li>- Is of sufficient width and thickness to support the total weight of the containers and contents</li> <li>- Has the lowest point of the tank at least eighteen inches above the ground.</li> </ul> Make sure the footings meet all of the following: <ul style="list-style-type: none"> <li>- Extend below the established frost line</li> <li>- Are of sufficient width and thickness to support the total weight of the containers and contents.</li> </ul>
Floating type foundations on containers installed aboveground	Make sure they are designed to adequately support the tank, contents, and pumping equipment.
A horizontal, above-ground container	Mount the container on a foundation that permits expansion and contraction. <ul style="list-style-type: none"> <li>Prevent the weight of excessive loads from resting on the supporting portion of the shell.</li> <li>Provide saddle bearing that extends over at least one-third the circumference of the shell.</li> <li>Prevent corrosion on the portions of the container in contact with the foundations or saddles.</li> </ul>

**You must:**

- Follow Table 3 for underground, non-refrigerated containers.

Table 3  
Underground Nonrefrigerated Container Requirements

If you have:	Then:
Underground containers	Set the containers on firm foundations or earth <ul style="list-style-type: none"> <li>- Surround containers with soft earth or sand well tamped into place.</li> </ul> Make sure the top of the container is at least one foot below the surface of the ground. <ul style="list-style-type: none"> <li>- If ground conditions make this impractical, use precautions to prevent physical damage to the container.</li> </ul> Exemption: It is not necessary to cover the portion of the container where a manhole and other connections are attached.
	Securely anchor or weight containers when necessary to prevent floating.

If you have:	Then:
	Have a protective corrosion resistant coating applied before it is placed underground that is both of the following: <ul style="list-style-type: none"> <li>– Satisfactory to the authority having jurisdiction;</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>– Equal to either hot dip galvanizing or two preliminary coatings of red lead followed by a heavy coating of coal tar or asphalt.</li> </ul>
	Lower containers onto firm foundations without damaging the protective corrosion resistant coating.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30045, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30050 Reinstallation.**

**You must:**

- Prohibit the reinstallation of nonrefrigerated, previously installed underground, containers unless they meet both of the following:
  - Pass a hydrostatic pressure retest using the original pressure specified by the Unfired Pressure Vessel Code under which the tank was constructed;**AND**
  - Show no evidence of serious corrosion.
- Maintain a corrosion resistant coating on reinstalled underground containers.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30050, filed 5/2/06, effective 9/1/06.]

**REFRIGERATED STORAGE TANKS**

**WAC 296-826-30055 Installation.**

**You must:**

- Support tanks on noncombustible foundations designed for the type of tank.
- Provide protection against flotation or other water damage, where high floodwater might occur.
- Prevent the effects of freezing and consequent frost heaving, in tanks used for product storage at less than 32°F, by providing either support or heat supply.
  - Prevent accidental discharge of liquids from spreading into uncontrolled areas by providing, to the area surrounding a refrigerated tank or group of tanks, one of the following:
    - A drainage system provided with at least a one percent slope that terminates in an impounding basin with a capacity as large as the largest tank served;**OR**
    - A diked enclosure with a capacity as large as the largest tank served.
  - Meet, when using a diked enclosure or an impounding basin in a drainage system, the following requirements:
    - The wall is made of earth, steel, or concrete. If made of earth, meet both of the following:
      - The top is flat and at least two feet wide;**AND**
      - There is a stable slope consistent with the angle of the earth used

- Design the wall to be both:
    - Liquid tight;**AND**
    - Able to withstand the hydrostatic pressure and the temperature.
      - Provide for drainage of rain water, that does not permit the release of ammonia, from diked or impounding areas.
- Note:**
- It is recommended that the ground in an impounding basin or within a diked enclosure be graded so that small spills or the early part of a large spill will accumulate at one side or corner contacting both:
    - A relatively small area of ground;**AND**
    - Exposing a relatively small surface area for heat gain.
  - Shallow channels in the ground surface or low curbs of earth can help guide the liquid to these low areas without contacting a large ground area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30055, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-30060 Reinstallation.**

**You must:**

- Make sure moved and reinstalled containers of a size to require field fabrication are reconstructed and reinspected to:
  - Meet the original Unfired Pressure Vessel Code under which the tank was manufactured and do the following according to the same code:
    - A pressure retest
    - Any necessary rerating.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-30060, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-400 Equipment and systems.**

**Your responsibility:**

To make sure all equipment and systems are operated and maintained safely.

- Electrical
  - WAC 296-826-40005
- Hose specifications
  - WAC 296-826-40010
- Piping, tubing, and fittings
  - General requirements for all systems
    - WAC 296-826-40015
  - Nonrefrigerated systems
    - WAC 296-826-40020
  - Systems mounted on trucks, semi-trailers, and trailers
    - WAC 296-826-40025
- Refrigeration storage
  - Refrigerated storage compressors
    - WAC 296-826-40030
  - Refrigeration load
    - WAC 296-826-40035
  - Separators for refrigerated storage
    - WAC 296-826-40040
  - Automatic control equipment for refrigerated storage
    - WAC 296-826-40045
  - Other refrigerated storage equipment
    - WAC 296-826-40050
  - Compressors for refrigerated systems
    - WAC 296-826-40055

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-400, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40005 Electrical.**

**You must:**

- Use electrical equipment and wiring on ammonia installations that is either of the following:
  - General purpose;
- OR**
- Weather resistant.
- Follow the electrical requirements found in another chapter, chapter 296-24 WAC, Part L for Class 1, Group D locations when the concentrations of ammonia in air are in excess of 16% by volume.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40005, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40010 Hose specifications.**

**You must:**

- Make sure hose used in ammonia service and subject to container pressure meets both of the following:
  - The *Joint Rubber Manufacturers Association, RMA-IP-14, Specifications for Anhydrous Ammonia Hose* 7th Edition 2003;
- AND**
- The *Fertilizer Institute "Hose Specifications for Anhydrous Ammonia."*
- Make sure hose assemblies are able to withstand a 500 psig pressure test.
- Follow Table 4 for hose specifications.

Table 4  
Hose Specifications

If you have:	Then:
Hose subject to container pressure	Design it with a minimum <ul style="list-style-type: none"> <li>– Working pressure of 350 psig</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>– Burst pressure of 1750 psig</li> </ul>
Hose and their connections	Design them for the maximum low side working pressure when located on either: <ul style="list-style-type: none"> <li>– The pressure reducing valves on devices discharging to atmospheric pressure;</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>– The low pressure side of flow control.</li> </ul>
	Design, construct, and install so there is no leakage when connected.
Liquid transfer hose that is not drained of liquid upon completion of transfer operations	Equip with an approved shut off valve at the discharge end. Prevent excessive hydrostatic pressure in the hose.
Hose with an outside diameter one-half inch and larger	Make sure the hose is marked and legible at five foot intervals.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40010, filed 5/2/06, effective 9/1/06.]

**PIPING, TUBING, AND FITTINGS**

**WAC 296-826-40015 General requirements for all systems.**

**You must:**

- Prohibit the use of cast iron fittings.
  - The use of malleable or nodular iron such as Specification ASTM A47 or ASTM A395 is permitted.
- Make sure all metal flexible connections for permanent installations have a minimum working pressure of 250 psig
- Make sure all pipes, tubes, and fittings used for ammonia service meet all of the following:
  - Made of material with a design pressure at least equal to the maximum service pressure.
  - Well supported and have provisions for all of the following:
    - Expansion
    - Contraction
    - Vibration
    - Jarring
    - Settling.
  - Protect all exposed pipes from damage resulting from undue strain including:
    - Moving machinery
    - The presence of vehicles.
  - Use ammonia resistant joint compounds.
  - Make sure, after assembly, that all piping and tubing are leak free at a pressure not less than the normal operating pressure of the system.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40015, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40020 Nonrefrigerated systems.**

**You must:**

- Make sure piping on nonrefrigerated systems is:
  - ASTM A-53-2004 Electrical Resistance Welded and Electric Flash Welded Pipe or equal. In addition piping needs to be:
    - At least schedule 80 when joints are threaded.
    - At least schedule 40 when joints are either welded or welded and flanged.
- Prohibit the use of piping or tubing made of any of the following:
  - Brass
  - Copper
  - Galvanized steel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40020, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40025 Systems mounted on trucks, semi-trailers, and trailers.**

**You must:**

- Make sure all piping, tubing, and fittings are:
  - Securely mounted
  - Protected against physical damage.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40025, filed 5/2/06, effective 9/1/06.]

**REFRIGERATED STORAGE****WAC 296-826-40030 Refrigerated storage compressors.****You must:**

- Make sure compressors have all of the following:
    - Their own driving unit
    - Discharge pressure that is governed by the condensing conditions
      - Suitable compressor operation controls based on the load pressure in the container
      - At least two compressors either of which is of sufficient size to handle the intended loads
      - Standby equipment equal to the largest normally operating piece of equipment installed when more than two compressors are provided
      - Automatic controls installed to prohibit the operation of alternate compressors unless the controls will function with alternate compressors.
    - Make sure compressors are sized to operate with a suction pressure that is both of the following:
      - At least ten percent below the minimum setting of the safety relief valves on the storage tank
      - Able to withstand one hundred twenty percent of the design pressure of the tank.
    - Install an oil separator of suitable size in the compressor discharge line that is both:
      - Designed for at least 250 psig;
- AND**
- Equipped with a drain valve and gauging device.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40030, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40035 Refrigeration load.****You must:**

- Make sure the total refrigeration load includes the loads imposed by all of the following:
    - Heat flow into the container caused by the temperature difference between both:
      - The ambient temperature;
- AND**
- The design storage temperature
    - Heat flow into the tank caused by maximum sun radiation
    - Filling the tank with ammonia warmer than the design storage temperature.
  - Provide emergency power capable of handling loads imposed by both of the following:
    - The temperature difference between the ambient temperature and the design storage temperature;
- AND**
- Sun radiation.

**Note:** Emergency power is not necessary for facilities able to effectively vent vapors when the refrigeration system is not operating.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40035, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40040 Separators for refrigerated storage.****You must:**

[Title 296 WAC—p. 2886]

- Install an entrainment separator, of suitable size and design pressure, in the compressor suction line that is equipped with both of the following:
  - A drain valve;

**AND**

- A gauging device.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40040, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40045 Automatic control equipment for refrigerated storage.****You must:**

- Install an emergency alarm to detect minimum and maximum allowable operating pressure changes.
- Install an emergency alarm and shut off in the condenser system to detect excess discharge pressure caused by the failure of the cooling medium.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40045, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40050 Other refrigerated storage equipment.****You must:**

- Discharge ammonia to storage by using either:
    - A receiver with an automatic float valve;
- OR**
- A high pressure liquid drain trap of suitable capacity.
  - Make sure receivers are:
    - Designed for at least 250 psig;
- AND**
- Equipped with all of the following:
    - Necessary connections
    - Safety relief valves
    - Gauging devices.
  - Cover insulated containers and pipelines with material that meets all of the following:
    - Thick enough for the temperatures it will be exposed to
    - Supported
    - Weather and fire resistant.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40050, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-40055 Compressors for refrigerated systems.****You must:**

- Make sure condensers are designed:
    - For at least 250 psig;
- AND**
- To manually or automatically purge noncondensibles.
- Note:**
- Condensers may be cooled by any of the following:
    - Air
    - Water
    - Air and water.

**You must:**

- Make sure compressors used for refrigerating ammonia meet all of the following:
  - Are connected to plant piping with shut off valves located as close as practical to compressor connections
  - Have a safety relief valve that is both:
    - Large enough to discharge the full capacity of the compressor;

**AND**

■ Connected to the discharge and placed before any shut off valve

– Have an oil separator on the discharge side, where necessary to prevent contamination.

– Have a drainable liquid trap or other adequate method on the compressor suction to minimize the entry of liquids into the compressor.

– Pressure gauges on the suction and discharge ends graduated to at least one and one-half times the maximum pressure that can develop.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-40055, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-500 Appurtenances.**

**Your responsibility:**

To follow the requirements in this section when using appurtenances.

Appurtenance requirements for all systems

WAC 296-826-50005

Nonrefrigerated stationary containers

WAC 296-826-50010

Refrigerated tanks

WAC 296-826-50015

Systems mounted on trucks, semi-trailers and trailers

WAC 296-826-50020

Systems mounted on farm trucks or trailers for transportation of ammonia

WAC 296-826-50025

Systems mounted on farm equipment for ammonia application

WAC 296-826-50030

Portable DOT containers

WAC 296-826-50035

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-500, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-50005 Appurtenance requirements for all systems.**

**Definition:**

Appurtenance means all devices such as pumps, compressor, safety relief devices, liquid-level gauging devices, valves and pressure gauges.

**You must:**

• Make sure each appurtenance installed before February 8, 1973, is determined to be safe by meeting one of the following:

– Approved, tested, and installed by either:

■ The American National Standard for the Storage and Handling of Anhydrous Ammonia (in effect at the time of installation)

■ The Fertilizer Institute Standards for the Storage and Handling of Agricultural Anhydrous Ammonia (in effect at the time of installation)

– Accepted, certified, listed, or labeled, by a nationally recognized testing laboratory

– Inspected or tested by a federal, state, municipal, or local authority responsible for enforcing occupational safety provisions, when no nationally recognized laboratory will provide approval

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– Tested and approved by a registered professional engineer or other qualified person if the system is a custom-designed or custom-built unit and no other recognized entity will provide approval

– Keep a document on file signed by the qualified person that indicates the unit is safe. Include the test bases, test data and results and the qualifications of the qualified person.

**You must:**

• Make sure container appurtenances are both of the following:

– Designed for at least the working pressure for the portion of the system where installed;

**AND**

– Fabricated from materials suitable for anhydrous ammonia service.

• Make sure fixed liquid level gauges, except on refrigerated storage:

– Are designed so the maximum volume of the container filled by liquid does not exceed eighty-five percent of its water capacity;

**AND**

– Have a coupling into which it is threaded that is placed at the eighty-five percent level of the container

■ If located elsewhere, install the dip tube of this gauge so it can not be easily removed.

• Equip each container, except those filled by weight, with an approved liquid level gauging device that does all of the following:

– Has a design pressure equal to or greater than the design pressure of the container

– Are arranged so the maximum liquid fill level of containers can be readily determined.

• Follow additional requirements found in Table 5, Appurtenance Requirements for all Systems

Table 5  
Appurtenance Requirements for all Systems

If you have:	Then make sure they:
Safety relief devices	Do not have discharge termination in or beneath any building.
Safety relief valves	Have a flow capacity that is not restricted by any connection to it on either the upstream or downstream side.
Connections to containers	Have shut off valves located as close to the container as possible. Exemption: Safety relief devices, gauging devices or devices fitted with a No. 54 drill size hole are not required to have shut off valves located as close to the container as possible.
Connections and the line, including valves and fittings	Have a greater rated flow than the excess flow valves that protects them
Excess flow valves, where required	Meet all of the following:

If you have:	<p>Then make sure they:</p> <ul style="list-style-type: none"> <li>• Are designed with a bypass no larger than a No. 60 drill size opening to allow equalization of pressures.</li> <li>• Close automatically at the rated flow of vapor or liquid specified by the manufacturer.</li> <li>• Maintain legible markings.</li> </ul>
Excess flow valves provided with shut off valves	Are designed to close if the shut off valve breaks during installation
Excess flow and back pressure check valves, where required	<p>Are located either:</p> <ul style="list-style-type: none"> <li>• Inside the container;</li> <li>OR</li> <li>• Outside the container as long as the excess flow valve is:                             <ul style="list-style-type: none"> <li>– As close as possible to the entrance of the line;</li> <li>AND</li> <li>– Installed without excessive stress that could result in breakage between the container and the valve.</li> </ul> </li> </ul>
<p>Liquid level gauging devices that:</p> <ul style="list-style-type: none"> <li>– Require bleeding of the product into the atmosphere such as the rotary tube, fixed tube, and slip tube devices</li> </ul>	<p>Are either:</p> <ul style="list-style-type: none"> <li>• Designed so that the maximum opening of the bleed valve is not larger than No. 54 drill size;</li> <li>OR</li> <li>• Provided with an excess flow valve.</li> </ul> <p>Exemption:</p> <ul style="list-style-type: none"> <li>– If openings from the containers or through fittings are attached directly onto the container where pressure gauge connections are made, then there is no need for excess flow valves as long as the openings are not larger than a No. 54 drill size</li> <li>– This requirement does not apply to farm vehicles used for the application of ammonia as covered by WAC 296-826-50030.</li> </ul>

**You must:**

- Follow Table 6, Safety Valve Start to Discharge Rate, and Table 7, Safety Relief Valve Rate of Discharge, for the following systems:
  - Nonrefrigerated stationary containers
  - Mounted on trucks, semi-trailers, and trailers used for the transportation of ammonia
  - Mounted on farm wagons for the transportation of ammonia
  - Mounted on farm equipment for the application of ammonia

**Exemption:** The rate of discharge of spring-loaded safety relief valves installed on underground containers may be reduced to thirty percent of the rate of discharge specified in Table 6, Safety Relief Valve Rate of Discharge so long as the container is not uncovered after installation until the liquid ammonia has been removed.

Table 6  
Safety Valve Start to Discharge Rate

Containers	Minimum	Maximum*
ASME U-68, U-69	110%	125%
ASME U-200, U-201	95%	100%
ASME 1952, 1956, 1959, 1962, 1965, 1968, or 1971	95%	100%
API-ASME	95%	100%
U.S. Coast Guard	(As required by U.S.C.G. regulations)	
DOT	(As required by DOT regulations)	

**Note:** A relief valve manufacturer's tolerance of plus ten percent is permitted.

Instructions are found below the table

Table 7  
Safety Relief Valve Rate of Discharge

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
20	258	145	1,310	340	2,640	1,350	8,160
25	310	150	1,350	350	2,700	1,400	8,410
30	360	155	1,390	360	2,760	1,450	8,650
35	408	160	1,420	370	2,830	1,500	8,900
40	455	165	1,460	380	2,890	1,550	9,140
45	501	170	1,500	390	2,950	1,600	9,380
50	547	175	1,530	400	3,010	1,650	9,620
55	593	180	1,570	410	3,070	1,700	9,860
60	639	185	1,600	420	3,130	1,750	10,090
65	685	190	1,640	430	3,190	1,800	10,330
70	731	195	1,670	440	3,250	1,850	10,560
75	777	200	1,710	450	3,310	1,900	10,800
80	823	210	1,780	460	3,370	1,950	11,030
85	869	220	1,850	470	3,430	2,000	11,260
90	915	230	1,920	480	3,490	2,050	11,490
95	961	240	1,980	490	3,550	2,100	11,720
100	1,007	250	2,050	500	3,610	2,150	11,950
105	1,053	260	2,120	510	3,670	2,200	12,180
110	1,099	270	2,180	520	3,730	2,250	12,400
115	1,145	280	2,250	530	3,790	2,300	12,630
120	1,191	290	2,320	540	3,850	2,350	12,850
125	1,237	300	2,380	550	3,910	2,400	13,080
130	1,283	310	2,450	560	3,970	2,450	13,300
135	1,329	320	2,510	570	4,030	2,500	13,520
140	1,375	330	2,570	580	4,090		

Table instructions:

- The surface area = the total outside surface area of the container in square feet.
- When the surface area is not stamped on the name plate or the marking is not legible, calculate the area by using the Table 8, Surface Area

Table 8  
Surface Area

If you have:	Then calculate as follows:
Cylindrical container with hemispherical heads	Area = overall length in feet times the outside diameter in feet times 3.1416
Cylindrical container with other than hemispherical heads	Area = (overall length in feet plus 0.3 outside diameter in feet) times outside diameter in feet times 3.1416
Spherical container	Area = outside diameter in feet squared times 3.1416

• Flow rate—CFM air = cubic feet per minute of air required at standard conditions, 60°F and atmospheric pressure (14.7 psia).

– The rate of discharge may be altered for intermediate values of surface area.

– For containers with total outside surface area greater than 2,500 sq. ft., the required flow rate can be calculated using the formula, flow rate CFM air = 22.11 A<sup>0.82</sup> where A = outside surface area of the container in square feet

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-50005, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-50010 Nonrefrigerated stationary containers.**

**IMPORTANT:**

In addition to this section, you need to follow the Appurtenances requirements for all systems, WAC 296-826-50005.

**You must:**

• Make sure all containers are equipped with all of the following:

- An approved vapor return valve
- A fixed maximum liquid level gauge
- A pressure gauge that is both:

■ Graduated from zero to 400 psig;

AND

■ Designed for use in ammonia service

• Provide one or more spring-loaded safety relief valves, or an equivalent type, on all containers.

• Make sure safety relief valves do all of the following:

– Discharge in the following ways:

■ Away from the container in an upward, unobstructed manner into the atmosphere

■ Not in or beneath a building

– Have raincaps that allow free discharge of the vapor and prevent the entrance of water

– Have a method for draining accumulated condensation

– Have a start to discharge, related to the design pressure of the container, according to Table 6, Safety Valve Start to Discharge Rate

- Are arranged to minimize the possibility of tampering
- Are provided, when the pressure setting adjustment is external, with a means of sealing the adjustment
- Have direct communication with the vapor space of the container

**Note:**

- Vent pipes from 2 or more safety relief devices located on the same unit, or similar lines from 2 or more different units, may be run into a common header if:
  - The cross-sectional area of the header is at least equal to the sum of the cross sectional areas of the individual vent pipes.

**You must:**

- Protect container appurtenances against physical damage and during transit of containers intended for underground installation.
- Make sure shut off valves are not installed between the safety relief valve and the container or system. A shut off valve may be used if arranged so that the required capacity flow is maintained.

**Exemption:**

- You are exempt from the requirement not to install the shut off valve between the safety relief valve and the container or systems in the following situations:
  - A three-way valve installed under two safety relief valves, each with
    - The required rate of discharge;
  - AND
  - Installed to allow either of the safety relief valves to be closed off but not at the same time.
  - Two separate relief valves are installed with individual shut off valves.
    - The two shut off valve stems must be mechanically interconnected to allow the full required flow of one safety relief valve at all times.
    - When a safety relief valve manifold that allows:
      - One valve of two or more to be closed off;
  - AND
  - The remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

**You must:**

- Make sure vapor and liquid connections have either of the following:
  - An approved excess flow valve;
- OR
- An approved quick-closing internal valve that remains closed except during operation.

**Exemption:**

- The following do not need to be fitted with excess flow valves:
  - Safety relief valves
  - Liquid level gauging devices that require both of the following:
    - Bleeding of the product into the atmosphere
    - Construction so that outward flow will not exceed that passed by a No. 54 drill size opening
  - Those with openings from the containers or through fittings that are attached directly onto the container where pressure gauge connections are made as long as:
    - The openings are not larger than a No. 54 drill size.

**You must:**

- Follow additional requirements found in Table 9, Appurtenances for Nonrefrigerated Stationary Containers

Table 9

Appurtenances for Nonrefrigerated Stationary Containers

If you have:	Then make sure they:
Columnar-type gauges	Are restricted to stationary storage installations

If you have:	Then make sure they:
	Are shielded against the direct rays of the sun Are equipped with all of the following: <ul style="list-style-type: none"> <li>• Shut off valves having metallic hand-wheels</li> <li>• Excess flow valves</li> <li>• Extra heavy glass that is adequately protected with a metal housing applied by the gauge manufacturer</li> </ul>
Main shut off valves	Are kept closed and locked when the installation is unattended Exemption: Valve locks are not required if the facility is protected against tampering by fencing or other suitable means.
Filling connections	Are provided with one of the following: <ul style="list-style-type: none"> <li>• Combination back-pressure check valve and excess flow valve</li> <li>• One double or two single back-pressure check valves</li> <li>• A positive shut off valve in conjunction with either an internal back-pressure check valve or an internal excess flow valve</li> </ul>
Underground installations with a probability of the manhole or housing becoming flooded	Have vent lines located above the high water level
	Have manholes or housings with ventilated louvers or their equivalent with the area of their openings equal or exceeding: <ul style="list-style-type: none"> <li>• The combined discharge areas of the safety relief valves and vent lines which discharge their content into the manhole housing</li> </ul>
Hydrostatic relief valves	Are installed between each pair of valves in the liquid ammonia piping or hose.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-50010, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-50015 Refrigerated tanks.**

**IMPORTANT:**

In addition to this section, you need to follow the Appurtenances requirements for all systems, WAC 296-826-50005.

**You must:**

- Protect container appurtenances against the following:
  - Physical damage during transit of containers intended for underground installation
  - Damage from vehicles.
- Make sure safety relief devices have a total relieving capacity larger than either of the following:

– A possible refrigeration system upset such as a cooling water failure, power failure, instrument air or instrument failure, mechanical failure of any equipment, excessive pumping rates or changing atmospheric pressure;

**OR**

– The amount based on using either one of the following fire exposure formulas (see note below for codes):

■ Valve manufacturers who use weight of vapors to be relieved as the classifying basis, use this formula:

$$W = \frac{34,500 F A (0.82)}{L}$$

**OR**

■ Valve manufacturers that classify valves based on air flows, use this formula:

$$Q_{(a)} = \frac{633,000 F AO.32}{LC}$$

• Make sure safety relief devices meet the following additional requirements:

– Are set to start-to-discharge at a pressure not in excess of the design pressure of the tank

– Have a total relieving capacity sufficient to prevent a maximum pressure in a tank of more than one hundred twenty percent of the design pressure.

• Provide shut off valves for all connections including plugs, safety valves, and thermometer wells:

– Locate them as close to the tank as is practical.

**Exemption:** Shut off valves do not need to be provided on connections with a No. 54 drill size restriction

**Note:** • Install, when operating conditions make it advisable, both of the following:

– A check valve on the fill connection

– A remotely operated shut off valve on other connections located below the maximum liquid level.

**You must:**

• Follow requirements found in Table 10, Refrigerated Tank Appurtenances

Table 10  
Refrigerated Tank Appurtenances

If you have:	Then make sure they:
Shut off valves used as a means of lock out for inspection or repair	Are of adequate flow capacity
	Are arranged to be locked or sealed open and not closed except by an authorized person who does both of the following: <ul style="list-style-type: none"> <li>• Remains there while the valve is closed</li> <li>• Locks or seals the valve open when leaving the station.</li> </ul>
Discharge line and header	Are designed to accommodate the maximum flow.
	Have a back pressure not greater than ten percent of the design pressure of the storage container
	Include the back pressure in the one hundred twenty percent of the maximum pressure of the design pressure.
	Do not have other containers or systems that exhaust into the discharge line or header.

If you have:	Then make sure they:
	Have vent lines installed to prevent the accumulation of liquid in the lines <b>Note:</b> Multiple safety relief valves on the same storage unit may be run through a common discharge header.
Vacuum breakers	Are provided with atmospheric storage
Stacks	Do both of the following: <ul style="list-style-type: none"> <li>• Prevent any obstructions by rain, snow, ice, or condensation; <b>AND</b></li> <li>• Have an outlet size not smaller than the size of the safety relief valve outlet connection</li> </ul>

**You must:**

• Make sure appurtenances meet all of the requirements found in the following:

– ANSI CGA C-7 2004

– ANSI CGA G2.1 1999

– API Standard 620 4th Edition, 2002

– ASHRAE 15 2004

– ASME 2001, Section VIII, Division 1

– ANSI B95.1 1977

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-50015, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-50020 Systems mounted on trucks, semi-trailers and trailers.**

**IMPORTANT:**

In addition to this section, you need to follow the Appurtenances requirements for all systems, WAC 296-826-50005.

**You must:**

• Make sure each container has all of the following

– Fixed maximum liquid level gauging devices

– Pressure-indicator gauges with a dial graduated from zero to 400 psig

– Either of the following:

■ Equipped for spray-loading, which fills in vapor space;  
**OR**

■ Has an approved vapor return valve of adequate capacity.

• Provide one or more spring-loaded safety relief valves, or an equivalent type, on all containers, that do all of the following:

– Discharges in the following ways:

■ Away from the container in an upward, unobstructed manner into the atmosphere

■ Not in or beneath a building.

– Has raincaps that allow free discharge of the vapor and prevent the entrance of water

– Has a method for draining accumulated condensation

– Has a start to discharge, related to the design pressure of the container, according to Table 6, Safety Valve Start to Discharge Rate

– Are arranged to minimize the possibility of tampering

– Provided, when the pressure setting adjustment is external, with a means of sealing the adjustment

– Has direct communication with the vapor space of the container

- Make sure shut off valves are not installed between the safety relief valve and the container or system. A shut off valve may be used if arranged so that the required capacity flow is maintained.

- Exemption:**
- You are exempt from the requirement not to install the shut off valve between the safety relief valve and the container or systems in the following situations:
    - A three-way valve installed under two safety relief valves, each with
      - The required rate of discharge;
- AND**
- Installed to allow either of the safety relief valves to be closed off but not at the same time.
    - Two separate relief valves are installed with individual shut off valves.
  - The two shut off valve stems must be mechanically interconnected to allow the full required flow of one safety relief valve at all times.
    - When a safety relief valve manifold that allows:
      - One valve of two or more to be closed off
- AND**
- The remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

- Follow additional requirements found in Table 11, Appurtenances for Systems Mounted on Trucks, Semi-Trailers and Trailers

Table 11  
Appurtenances for Systems Mounted on Trucks, Semi-Trailers and Trailers

If you have:	Then make sure they:
All container connections	Are provided with either of the following: Automatic excess flow valves; <b>OR</b> Quick-closing internal valves that remain closed except during delivery operations <b>Note:</b> If the control mechanism is provided with a secondary control remote from the delivery connection, then a fusible section (melting point 208°F to 220°F) is required to permit the internal valve to close automatically in case of fire. <b>Exemption:</b> Filling connections, safety relief devices, and liquid level and pressure gauge connections are exempt from automatic excess flow valves and quick-closing internal valves.
Filling connections	Prevent back-flow in the event the filling connection breaks with at least one of the following: <ul style="list-style-type: none"> <li>• Automatic back pressure check valves</li> <li>• Excess flow check valves</li> <li>• Quick closing internal valves</li> </ul> <b>Exemption:</b> <ul style="list-style-type: none"> <li>• An automatic valve is not required if:                             <ul style="list-style-type: none"> <li>– The filling and discharge connect to a common opening in the container shell;</li> </ul> </li> </ul> <b>AND</b>

If you have:	Then make sure they:
Nonrecessed container fittings and appurtenances	– The opening is fitted with a quick-closing internal valve Are protected against physical damage by one of the following methods: <ul style="list-style-type: none"> <li>• A protected location</li> <li>• The vehicle frame or bumper</li> <li>• A protective housing that meets the following:                             <ul style="list-style-type: none"> <li>– Is fabricated from material that is compatible with the containers design and construction requirements</li> <li>– Designed to withstand static loadings in any direction equal to twice the weight of the container and attachments when filled using a safety factor of not less than 4, based on the ultimate strength of the material used</li> </ul> </li> </ul> <b>Note:</b> Protect nonrecessed container fittings and appurtenances with a weather cover as needed for proper operation of valves and safety relief devices
Columnar-type gauges	Are restricted to stationary storage installations Are shielded against the direct rays of the sun Are equipped with all of the following: <ul style="list-style-type: none"> <li>– Shut off valves having metallic hand-wheels</li> <li>– Excess flow valves</li> <li>– Extra heavy glass that is adequately protected with a metal housing applied by the gauge manufacturer</li> </ul>
Hydrostatic relief valves	Are installed between each pair of valves in the liquid ammonia piping or hose.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-50020, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-50025 Systems mounted on farm trucks or trailers for transportation of ammonia.**

**IMPORTANT:**

- This section applies to containers of three thousand gallons capacity or less and pertinent equipment mounted on farm trucks or trailers used for the transportation of ammonia.
- In addition to this section, you need to follow the Appurtenances requirements for all systems, WAC 296-826-50005.

**You must:**

- Make sure all containers are equipped with a fixed maximum liquid level gauge.
- Make sure vapor and liquid connections have either of the following:
  - An approved excess flow valve;

**OR**

– An approved quick-closing internal valve that remains closed except during operation.

- Exemption:**
- The following do not need to be fitted with excess flow valves:
    - Safety relief valves
    - Those with openings from the containers or through fittings that are attached directly onto the container where pressure gauge connections are made as long as the openings are not larger than a No. 54 drill size.

- Provide one or more spring-loaded safety relief valves, or an equivalent type, on all containers, that do all of the following:

- Discharges in the following ways:

- Away from the container in an upward, unobstructed manner into the atmosphere

- Has raincaps that allow free discharge of the vapor and prevent the entrance of water

- Has a method for draining accumulated condensation

- Has a start to discharge, related to the design pressure of the container, according to Table 6, Safety Valve Start to Discharge Rate

- Are arranged to minimize the possibility of tampering

- Provided, when the pressure setting adjustment is external, with a means of sealing the adjustment

- Has direct communication with the vapor space of the container

- Make sure shut off valves are not installed between the safety relief valve and the container or system. A shut off valve may be used if arranged so that the required capacity flow is maintained.

- Exemption:**
- You are exempt from the requirement not to install the shut off valve between the safety relief valve and the container or systems in the following situations:

- A three-way valve installed under two safety relief valves, each with

- The required rate of discharge;

**AND**

- Installed to allow either of the safety relief valves to be closed off but not at the same time.

- Two separate relief valves are installed with individual shut off valves.

- The two shut off valve stems must be mechanically interconnected to allow the full required flow of one safety relief valve at all times.

- When a safety relief valve manifold that allows:

- One valve of two or more to be closed off

**AND**

- The remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

- Secure both ends of the hose while in transit

- Make sure all containers with a capacity exceeding two hundred fifty gallons are equipped with both of the following:

- A pressure gauge with a dial graduated from 0-400 psig;

**AND**

- A method for spray loading or with an approved vapor return valve

- Follow additional requirements found in Table 12, Appurtenances for Systems Mounted on Farm Trucks or Trailers

(2007 Ed.)

Table 12  
Appurtenances for Systems Mounted on Farm Trucks or Trailers

If you have:	Then make sure they:
Filling connections	Are fitted with one of the following: <ul style="list-style-type: none"> <li>– A combination back-pressure check valve and excess flow valve</li> <li>– One double or two single back-pressure check valves</li> <li>– A positive shut off valve used with either an:                             <ul style="list-style-type: none"> <li>■ Internal back-pressure check valve;</li> <li><b>OR</b></li> <li>■ Internal excess flow valve</li> </ul> </li> </ul>
A fully enclosed guard	Have properly vented safety relief valves.
Fittings	Are protected from physical damage by a rigid guard designed: <ul style="list-style-type: none"> <li>– To withstand static loading in any direction equal to twice the weight of the container and loading</li> <li>– With a safety factor of four based on the maximum strength of the material used</li> </ul>
Liquid withdrawal lines installed in the bottom of the container	Have connections, including the hose, that are not lower than the lowest horizontal edge of the truck axle
Columnar-type gauges	Are shielded against the direct rays of the sun Are equipped with all of the following: <ul style="list-style-type: none"> <li>– Shut off valves having metallic hand-wheels</li> <li>– Excess flow valves</li> <li>– Extra heavy glass that is adequately protected with a metal housing applied by the gauge manufacturer</li> </ul>
Hydrostatic relief valves	Are installed between each pair of valves in the liquid ammonia piping or hose.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-50025, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-50030 Systems mounted on farm equipment for ammonia application.**

**IMPORTANT:**

- This section applies to systems mounted on farm equipment and used for the filed application of ammonia.

- In addition to this section, you need to follow the Appurtenances requirements for all systems, WAC 296-826-50005.

**You must:**

- Make sure each container has a fixed maximum liquid-level gauge.

- Provide one or more spring-loaded safety relief valves, or an equivalent type, on all containers, that do all of the following:

- Discharges in the following ways:

- Away from the container in an upward, unobstructed manner into the atmosphere

- Not in or beneath a building.

- Has raincaps that allow free discharge of the vapor and prevent the entrance of water

- Has a method for draining accumulated condensation

- Has a start to discharge, related to the design pressure of the container, according to Table 6, Safety Valve Start to Discharge Rate

- Are arranged to minimize the possibility of tampering

- Provided, when the pressure setting adjustment is external, with a means of sealing the adjustment

- Has direct communication with the vapor space of the container

**You must:**

- Make sure shut off valves are not installed between the safety relief valve and the container or system. A shut off valve may be used if arranged so that the required capacity flow is maintained.

**Exemption:** • You are exempt from the requirement not to install the shut off valve between the safety relief valve and the container or systems in the following situations:

- A three-way valve installed under two safety relief valves, each with

- The required rate of discharge;

AND

- Installed to allow either of the safety relief valves to be closed off but not at the same time.

- Two separate relief valves are installed with individual shut off valves.

- The two shut off valve stems must be mechanically interconnected to allow the full required flow of one safety relief valve at all times.

- When a safety relief valve manifold that allows:

- One valve of two or more to be closed off;

AND

- The remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

- Follow additional requirements found in Table 13, Appurtenances for Systems Mounted on Farm Equipment for Ammonia Application

Table 13

Appurtenances for Systems Mounted on Farm Equipment for Ammonia Application

If you have:	Then make sure they:
Filling connections	<p>Are fitted with one of the following:</p> <ul style="list-style-type: none"> <li>– A combination back-pressure check valve and excess flow valve</li> <li>– One double or two single back-pressure check valves</li> <li>– A positive shut off valve used with either an:                             <ul style="list-style-type: none"> <li>■ Internal back-pressure check valve;</li> <li>OR</li> <li>■ Internal excess flow valve</li> </ul> </li> </ul> <p>Exemption:</p>

If you have:	Then make sure they:
	<ul style="list-style-type: none"> <li>• An excess-flow valve is not required in either of the following:                             <ul style="list-style-type: none"> <li>– Vapor connection providing you meet both of the following:                                     <ul style="list-style-type: none"> <li>■ The controlling orifice is not in excess of seven-sixteenths of an inch in diameter;</li> </ul> </li> <li>AND                                     <ul style="list-style-type: none"> <li>■ The valve is hand-operated (attached hand-wheel or equivalent) shut off valve;</li> </ul> </li> <li>OR                                     <ul style="list-style-type: none"> <li>– In the liquid withdrawal line if the controlling opening between the contents of the container and the outlet of the shut off valve do not exceed 7/16 inch in diameter.</li> </ul> </li> </ul> </li> </ul> <p>Note: To assist in filling applicator tanks, you are allowed to bleed vapors into the open air if you meet the above requirements.</p>
Columnar-type gauges	<p>Are shielded against the direct rays of the sun</p> <p>Are equipped with all of the following:</p> <ul style="list-style-type: none"> <li>– Shut off valves having metallic hand-wheels</li> <li>– Excess flow valves</li> <li>– Extra heavy glass that is adequately protected with a metal housing applied by the gauge manufacturer</li> </ul>
An applicator tank that is both of the following: Trailed; AND The metering device is remotely mounted (for example on a tractor tool bar)	Use an automatic break-away type, self-closing, coupling
Hydrostatic relief valves	Are installed between each pair of valves in the liquid ammonia piping or hose.

**Note:**

- Metering devices may be connected directly to the tank withdrawal valve.
- A union type connection is acceptable between the tank valve and metering device

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-50030, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-50035 Portable DOT containers.**

**IMPORTANT:**

- This section applies to systems that use cylinders, portable tanks (DOT-51), or ton containers (DOT-106A, DOT-110A).

• In addition to this section, you need to follow the Appurtenances requirements for all systems, WAC 296-826-50005.

**You must:**

- Make sure safety relief devices meet DOT specifications.
- Provide the following protection:
  - To valves and pressure regulating equipment from tampering once installed for use
  - To containers:
    - From heat sources such as radiant flame and steam pipes. Do not apply heat directly to containers to raise the pressure
    - From moving vehicles or external damage while being stored
    - From ignitable debris and to prevent external corrosion while being stored. Storage can be indoors or outdoors.
- Protect container valves while in transit, in storage, and while being moved into final use by doing either of the following:
  - Setting them into the recess of the container;
  - OR**
  - By fastening a ventilated cap or collar to the container that can withstand a blow from any direction equivalent to a thirty-pound weight being dropped four feet
  - Construction should be such that a blow will not be transmitted to the valves or other connections.
- Keep outlet valves tightly closed when containers are not connected for service on all empty or loaded containers
  - Secure the valve protection cap, if the container is designed for one, when the container is not in service.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-50035, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-600 Operations.**

**Your responsibility:**

- To protect employees while transporting, transferring, loading and unloading anhydrous ammonia.
- Mounting containers on trucks, semi-trailers and trailers  
WAC 296-826-60005
- Mounting containers on farm trucks or trailers for transporting ammonia  
WAC 296-826-60010
- Tank car loading or unloading  
WAC 296-826-60015
- Transferring liquids
  - General specifications  
WAC 296-826-60020
  - Additional requirements for systems mounted on trucks, semi-trailers, and trailers for transporting ammonia  
WAC 296-826-60025
- Filling densities
  - Nonrefrigerated containers  
WAC 296-826-60030
  - Refrigerated tanks  
WAC 296-826-60035
  - Welding  
WAC 296-826-60040

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-600, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-60005 Mounting containers on trucks, semi-trailers and trailers.**

**You must:**

- Make sure the method for attaching any container to the cradle, frame, or chassis of a vehicle is based on both of the following:
  - Two "g" loading in either direction
  - Using a safety factor of at least four based on the maximum strength of the material used.

**Note:**

- Two "g" is either of the following:
  - For load support it is equivalent to three times the static weight of the supported articles
  - For loading and bending, acceleration, and torsion it is equivalent to twice the static weight support applied horizontally at the road surface.

**You must:**

- Secure both ends of the hose during transit.
- Follow the requirements in Table 14, Additional Container Mounting Requirements.

Table 14  
Additional Container Mounting Requirements

If you have:	Then:
"Hold-down" devices	Anchor the container to the cradle, frame, or chassis so there is no area of unnecessary stress
	Lock the container down tightly
	Provide stops or anchors to minimize movement between the container and the framing Note: Movement could be the result of stopping, starting or changing direction.
Vehicles with cargo tanks designed with stress members instead of a frame	Support the tank with external cradles suspended at least one hundred twenty degrees of the shell circumference
	The design calculation needs to include all of the following stressors: <ul style="list-style-type: none"> <li>– Beam</li> <li>– Shear</li> <li>– Torsion</li> <li>– Bending moment</li> <li>– Acceleration</li> <li>– Any other stresses covered by the code of the cargo tank design.</li> </ul>
A liquid withdrawal line installed in the bottom of a container	Then make sure the connections to the container, including the hose, are not lower than the lowest horizontal edge of the trailer axle.
A cradle and container that are not welded together	Use suitable material between them to eliminate metal-to-metal friction.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60005, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-60010 Mounting containers on farm trucks or trailers for transporting ammonia.**

**You must:**

- Make sure tanks mounted on farm trucks and trailers meet all of the following:
  - Are securely attached using drawbars and safety chains
  - Follow behind the towing vehicle without swerving
  - Have at least five gallons of readily available clean water.
- Do all of the following when mounting containers on farm trucks:
  - Use suitable material between the cradle and the container to eliminate metal-to-metal friction
    - This is not necessary if the cradle and container are welded together
  - Use stops and hold down devices to prevent displacement.
- Distribute the container's weight, when mounted on four-wheel farm trucks or trailers, evenly over both axles.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60010, filed 5/2/06, effective 9/1/06.]

#### **WAC 296-826-60015 Tank car loading or unloading.**

##### **You must:**

- Establish a location for tank car loading and unloading operations.
  - Assign employees and instruct them in the unloading of tank cars.
    - Make sure, when unloading cars, to set the brake and block the wheels.
    - Make sure the track of tank siding is level.
    - Place caution signs on the track or car to warn approaching persons of loading and unloading operations that are:
      - Kept in place until the car is unloaded and disconnected from discharge connections.
    - Make sure these caution signs meet all of the following:
      - Are made of metal or other suitable material
      - Are at least twelve to fifteen inches in size
      - Read either "STOP-Tank Car Connected" or "STOP-Men at Work" meeting the following criteria:
        - "STOP" at least four inches high
        - All other words at least two inches high
        - All with white letters on a blue background.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60015, filed 5/2/06, effective 9/1/06.]

### **TRANSFERRING LIQUIDS**

#### **WAC 296-826-60020 General specifications.**

##### **You must:**

- Get owner authorization to use transfer containers.
- Make sure transfer containers are gauged and filled in either:
  - Open atmospheres;
- OR**
- Buildings approved for that purpose.
- Make sure pumps used to transfer ammonia meet all of the following:
  - Have a manufacturer's label for ammonia service
  - Are designed for at least 250 psig working pressure
  - Have a constant differential relief valve discharging into the suction port that:
    - Is installed on positive displacement pumps;

[Title 296 WAC—p. 2896]

##### **AND**

- Meets the pump manufacturer's recommendation for the settings and installation
  - Have a pressure gauge graduated zero to 400 psig installed on the discharge side before the relief valve line.
- Make sure plant pipes with shut off valves are located as close as possible to the pump connections.
  - Make sure meters used for measuring liquid anhydrous ammonia:
    - Are recommended and labeled for ammonia service by the manufacturer
    - Are designed for a minimum working pressure of 250 psig
    - Incorporate devices that prevent unintended measurement of vapor.
  - Do the following when transferring ammonia:
    - Maintain ammonia at a temperature suitable for the receiving container
    - Have at least one attendant supervise the transfer from the time connections are made to when disconnection occurs
    - Do NOT use flammable gases or gases that will react with ammonia, such as air to unload tank cars or transport trucks.
  - Make sure compressors used for transferring ammonia meet all of the following:
    - Have a working pressure of at least 250 psig when transferring ammonia.

- If crank cases of compressors are not designed to withstand system pressure, then provide protection with a suitable safety relief valve
  - Are connected to plant piping with shut off valves located as close as practical to compressor connections
  - Have a safety relief valve that is both:
    - Large enough to discharge the full capacity of the compressor;

##### **AND**

- Connected to the discharge before any shut off valve
    - Have an oil separator on the discharge side, where necessary to prevent contamination
    - Have a drainable liquid trap or other adequate method on the compressor suction to minimize the entry of liquids into the compressor
    - Pressure gauges on the suction and discharge ends graduated to at least one and one-half times the maximum pressure that can develop.
  - Protect loading and unloading systems in the event of hose severance by suitable devices where necessary, such as:
    - Backflow check valves;
- OR**
- Properly sized excess flow valves.

**Note:** If such valves are not practical, remotely operated shut off valves may be installed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60020, filed 5/2/06, effective 9/1/06.]

#### **WAC 296-826-60025 Additional requirements for systems mounted on trucks, semi-trailers, and trailers for transporting ammonia.**

##### **You must:**

- Make sure the content of vehicle containers is determined by one of the following:

- Weight
- Liquid-level gauging devices
- Meters

**OR**

- Other approved methods.

• Use a thermometer well when the content of a container is determined by liquid-level measurement. Make sure of the following:

- The volume, when converted to weight, does not exceed the DOT filling density requirement.
- Protect pumps and compressors against physical damage when mounted on trucks or trailers.
- Unload tank motor vehicles with a water capacity greater than 3500 gallons at approved locations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60025, filed 5/2/06, effective 9/1/06.]

**FILLING DENSITIES**

**WAC 296-826-60030 Nonrefrigerated containers.**

**You must:**

- Make sure filling densities for nonrefrigerated containers are below or equal to the requirements in Table 15, Filling Densities.

Table 15  
Filling Densities

Containers	Aboveground Containers	Underground Containers
Uninsulated	56%	58%
Insulated	57%	—

- Note:**
- For uninsulated, aboveground containers, the 56% corresponds to:
    - 82% by volume at -28°F.
    - 85% by volume at 5°F
    - 87.5% by volume at 30°F
    - 90.6% by volume at 60°F.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60030, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-60035 Refrigerated tanks.**

**You must:**

Make sure refrigerated tanks are not liquid full at a liquid temperature so that the vapor pressure is below the "start-to-discharge" pressure setting of the safety relief valve.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60035, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-60040 Welding.**

**You must:**

Permit welding only on the saddle plates, lugs, or brackets attached to the container by the manufacturer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-60040, filed 5/2/06, effective 9/1/06.]

**WAC 296-826-900 Definitions.**

**Appurtenance**

All devices that are added onto the system such as pumps, compressors, safety relief devices, liquid-level gauging devices, valves, and pressure gauges.

(2007 Ed.)

**Capacity**

The total volume of the container measured in U.S. gallons, unless otherwise specified.

**Container**

All vessels, tanks, cylinders or spheres used for transportation, storage or application of anhydrous ammonia.

**Cylinder**

A container constructed according to the United States Department of Transportation Specifications with a water capacity of one thousand pounds or less.

**Design pressure**

The same as the "maximum allowable working pressure" as used in the Unfired Pressure Vessel Code.

**DOT regulations**

The department of transportation (DOT) hazardous materials regulations and Specifications for Shipping Containers found in:

- Title 49—Transportation, Code of Federal Regulations, Parts 171 to 190, inclusive.

**Filling density**

The ratio of the weight of the gas in a container to the weight of water at 60°F that the container will hold. One lb. H<sub>2</sub>O = 27.737 cu. in. at 60°F

- For determining the weight capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60°F in air is 8.32828 pounds.

**Gas**

Anhydrous ammonia in either the gaseous or liquefied state.

**Hydrostatic relief valve**

An automatic pressure activated valve for liquid service

- It is characterized by a throttle or slow weep opening, a nonpop action.

- Refer to American National Standards Institute, Terminology for Pressure Relief Devices, B95.1 for more information.

**"psig" and "psia"**

Abbreviations that mean the following:

- "psig" refers to pounds per square inch gauge
- "psia" refers to absolute pounds per square inch.

**Safety relief valve**

An automatic spring loaded or equivalent type pressure activated device for gas or vapor service

- It is characterized by a pop action upon opening, and is sometimes referred to as a pop valve.

- Refer to American National Standards Institute, Terminology for Pressure Relief Devices, B95.1 for more information.

**Semi-trailer**

Every vehicle that meets both of the following:

- Designed for carrying property and for being drawn by a motor vehicle
- Constructed so that some part of its weight and the weight of its load rests upon or is carried by another vehicle.

**Systems**

An assembly of equipment consisting of the container or containers, appurtenances, pumps, compressors, and interconnecting piping.

**Tank motor vehicle**

Any motor vehicle designed or used for the transportation of anhydrous ammonia that has either:

- A tank designed to be permanently attached to any motor vehicle;

**OR**

- A container that is not permanently attached but needs to be loaded and unloaded without being removed from the motor vehicle due to its size, construction, or means of attachment.

**Trailer**

Every vehicle meeting all of the following:

- Designed for carrying property and for being drawn by a motor vehicle
- Constructed so that no part of its weight except the towing device rests on the towing vehicle.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-10-067, § 296-826-900, filed 5/2/06, effective 9/1/06.]

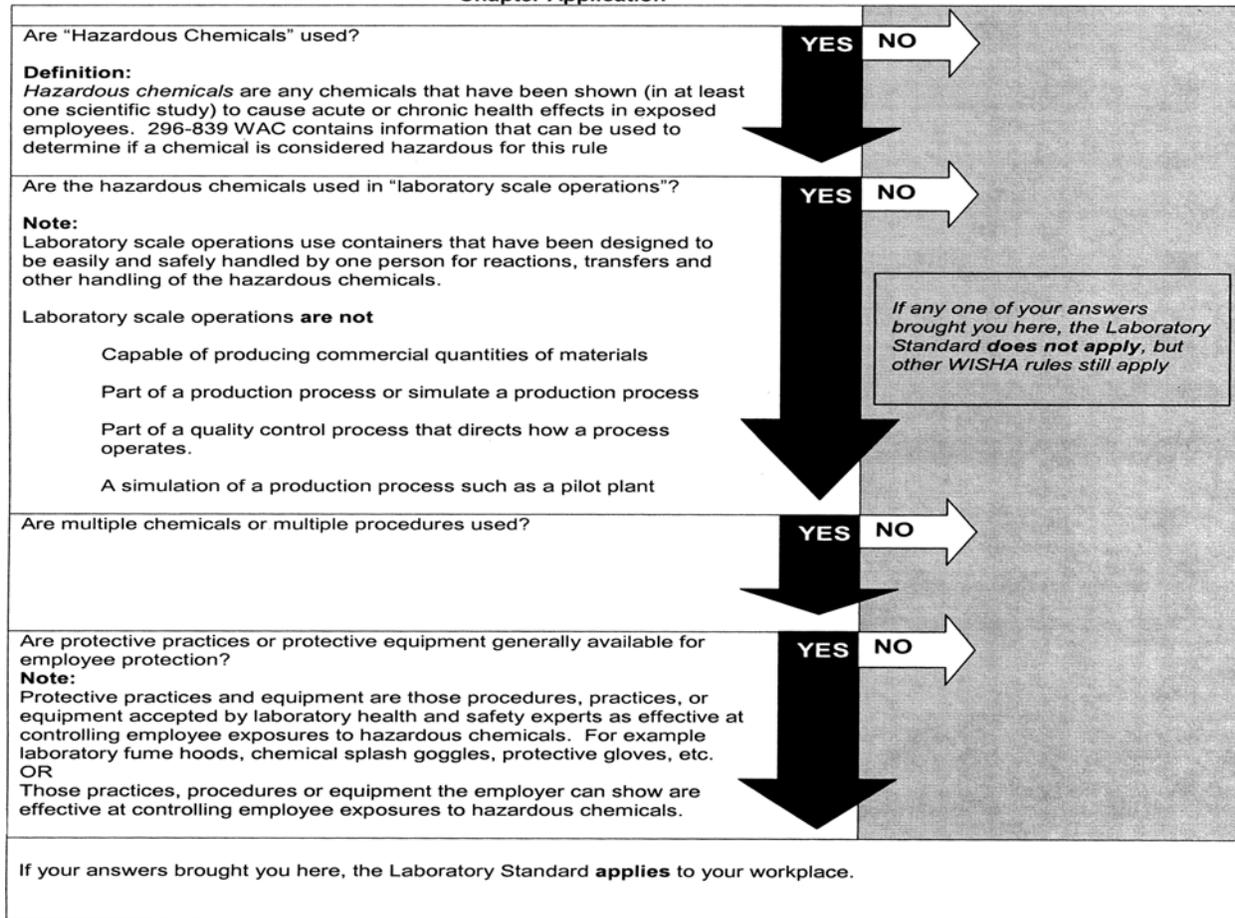
**Chapter 296-828 WAC  
HAZARDOUS CHEMICALS IN LABORATORIES**

**WAC**

- 296-828-100 Scope.
- 296-828-200 Using hazardous chemicals in laboratories.
- 296-828-20005 Chemical hygiene plan.
- 296-828-20010 Exposure evaluation.
- 296-828-20015 Training.
- 296-828-20020 Labeling and material safety data sheets (MSDSs).
- 296-828-20025 Chemicals produced in laboratories.
- 296-828-20030 Medical evaluations.
- 296-828-300 Definitions.

**WAC 296-828-100 Scope.** This chapter applies to the laboratory use of hazardous chemicals. To determine if this chapter applies to your workplace, use Table 1.

**Table 1  
Chapter Application**



**IMPORTANT:**

- When your laboratory operation is covered by this chapter, and you use any of the substances in Table 2, the following applies:
  - The exposure limits and any requirement protecting employees from skin and eye contact in the rules listed in Table 2 will still apply.
  - Where the action level (or where no action level exists, the permissible exposure limit) is exceeded for a substance

listed in Table 2, the exposure evaluation and medical surveillance requirements in the substance rule will still apply.

- You are not required to meet other requirements of the substance rule.

- To get the permissible exposure limits (PELs) for hazardous chemicals used in your laboratory, see chapter 296-841 WAC, Respiratory hazards.

**Table 2**  
**WISHA Regulated Hazardous Chemicals**

Acrylonitrile
Arsenic (inorganic)
Asbestos
Benzene
Butadiene
Cadmium
Coke ovens
Cotton dust
1, 2-Dibromo-3-chloropropane
Ethylene oxide
Formaldehyde
Lead
Methylene chloride
Methylenedianiline
Vinyl chloride
Ionizing radiation
4-Nitrobiphenyl
Alpha-Naphthylamine
4,4' Methylene bis (2 - chloroaniline)
Methyl chloromethyl ether
3,3'-Dichlorobenzidine (and its salts)
Bis-Chloromethyl ether
Beta-Naphthylamine benzidine
4-Aminodiphenyl
Ethyleneimine
Beta-Propiolactone
2-Acetylaminofluorene
4-Dimethylaminoazobenzene
N-Nitrosodimethylamine

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-100, filed 1/3/06, effective 4/1/06.]

### **WAC 296-828-200 Using hazardous chemicals in laboratories. Your responsibility:**

To protect employees from laboratory use of hazardous chemicals.

WAC 296-828-20005

Chemical hygiene plan.

WAC 296-828-20010

Exposure evaluation.

WAC 296-828-20015

Training.

WAC 296-828-20020

Labeling and material safety data sheets (MSDSs).

WAC 296-828-20025

Chemicals produced in laboratories.

WAC 296-828-20030

Medical evaluations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-200, filed 1/3/06, effective 4/1/06.]

### **WAC 296-828-20005 Chemical hygiene plan.**

#### **You must:**

- Develop and carry out a written chemical hygiene plan (CHP) that will protect your employees from hazardous substances in the laboratory and keep exposure levels below those listed in Respiratory hazards, chapter 296-841 WAC.

(2007 Ed.)

- Make sure the written plan is readily available to employees and their representatives.

- Include the following elements in your written CHP:

- The names or job titles of the chemical hygiene officer, other personnel responsible for implementing the CHP, or when appropriate, the members of a chemical hygiene committee.

- Standard operating procedures that provide employee protection when working with hazardous substances.

- Criteria for how you will select and use control measures to reduce employee exposures to hazardous chemicals, especially chemicals known to be extremely hazardous.

- Additional employee protection for select carcinogens, reproductive toxins, and chemicals with high degree of acute toxicity. The following will be considered, when appropriate:

- The establishment of exposure control areas.

- Containment devices, such as fume hoods or glove boxes.

- The safe removal of contaminated waste.

- Procedures for decontamination.

- Specific measures to make sure fume hoods and other protective equipment provide proper and adequate performance and are properly functioning.

- The circumstances when specific laboratory operation, activity, or procedure requires prior approval from the employer or their designated representative before implementation.

- A description of how you are going to train and inform your employees about laboratory use of hazardous chemicals.

- A description of your provisions for medical consultations and medical examinations.

- Review and evaluate the effectiveness of your written CHP at least annually and update as necessary.

**Reference:** This publication can provide you with additional information to help you with your written chemical hygiene plan:

National Research Council, Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, Washington, DC, 1995.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-20005, filed 1/3/06, effective 4/1/06.]

### **WAC 296-828-20010 Exposure evaluation.**

#### **IMPORTANT:**

For any of the specific substances listed in Table 2 of the scope of this chapter, you need to follow the exposure evaluation procedures found in the chapters regulating those substances if employee exposure routinely exceeds the AL or PEL. For all other employee exposures follow this section to determine exposure evaluation procedures.

#### **You must:**

- Determine if you could have a respiratory hazard as described in chapter 296-841 WAC, Respiratory hazards.

**Reference:** For additional requirements relating to respiratory hazards, see:

- Chapter 296-841 WAC, Respiratory hazards.

- Chapter 296-842 WAC, Respirators.

- The specific rule for your chemical.

#### **You must:**

- Provide written notification of exposure monitoring results to employees represented by your exposure evaluation, within five business days after the results become known to you.

- Note:**
- You can notify employees either individually or by posting the notification in areas readily accessible to all affected employees.
  - Posted notifications may need information that allows affected employees to determine which monitoring results apply to them.
  - Notification may be:
    - In any written form, such as hand-written or e-mail.
    - Limited to the required information, such as exposure monitoring results.

- Reference:**
- For additional requirements relating to employee exposure records, go to Access to records, chapter 296-802 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-20010, filed 1/3/06, effective 4/1/06.]

### WAC 296-828-20015 Training.

#### You must:

- Inform employees about the presence of hazardous chemicals at the following times:
  - At the time of initial assignment to a work area where hazardous chemicals are present.
  - Prior to situations involving a new exposure to hazardous chemicals.
- Train employees on all of the following:
  - Methods and observations for detecting the presence or release of hazardous substances. Examples of these methods and observations may include:
    - Monitoring conducted by you.
    - Continuous monitoring devices.
    - Visual appearance or odor of hazardous chemicals when being released.
      - The physical and health hazards of chemicals in the work area.
      - The procedures and measures employees can use to protect themselves from hazardous substances. Examples of these include:
        - Appropriate work practices.
        - Emergency procedures.
        - Personal protective equipment.
  - Provide refresher training to fit your needs.
  - Provide information to employees on all of the following:
    - The contents of this chapter and where to find a copy.
    - Permissible exposure limits found in chapter 296-841 WAC, Respiratory hazards.
    - Any recommended exposure levels for compounds without an exposure limit in the WISHA rules. Examples include:
      - The RELs found in the National Institute for Occupational Safety and Health (NIOSH) NIOSH Pocket Guide to Chemical Hazards 2004; or
      - The American Conference of Governmental Industrial Hygienists (ACGIH®) Documentation of the Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), 7th Ed.
    - Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory.
    - Where to find a copy of:
      - Your chemical hygiene plan.
      - Material safety data sheets (MSDSs), including those received from the chemical suppliers.

[Title 296 WAC—p. 2900]

- Reference material on the hazards, safe handling, storage, and disposal of hazardous chemicals found in the laboratory.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-20015, filed 1/3/06, effective 4/1/06.]

### WAC 296-828-20020 Labeling and material safety data sheets (MSDSs).

#### You must:

- Make sure labels on incoming containers are not removed or defaced.
- Keep and make available to employees any MSDS received with an incoming container of hazardous chemicals.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-20020, filed 1/3/06, effective 4/1/06.]

### WAC 296-828-20025 Chemicals produced in laboratories.

#### You must:

- Follow Table 3 for chemical substances produced in your laboratory.

**Table 3**  
**Lab Produced Chemical Substance Requirements**

If	Then
The chemical is a hazardous chemical	Follow all appropriate requirements of this chapter
A chemical by-product is produced and its composition is unknown	Assume it is a hazardous chemical  AND Follow your chemical hygiene plan to protect employees
You produce chemicals in your laboratory for users outside the laboratory	Follow chapter 296-839 WAC, MSDS and label preparation

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-20025, filed 1/3/06, effective 4/1/06.]

### WAC 296-828-20030 Medical evaluations.

#### IMPORTANT:

For any of the specific substances listed in Table 2 of the scope of this chapter, you need to follow the medical evaluation procedures found in the chapters regulating those substances if employee exposure routinely exceeds the AL or PEL. For all other employee exposures follow this section to determine medical evaluation procedures.

#### You must:

- (1) Make medical evaluations available when:
  - An employee develops signs or symptoms associated with a hazardous substance from laboratory exposure.
  - Any emergency situation that could cause a hazardous exposure, such as a spill, leak, or explosion, occurs.
  - A medical provider recommends a follow-up evaluation.
  - Exposure monitoring for any of the substances found in Table 2 reveals exposures routinely over the action level (AL) or in the absence of an AL the permissible exposure level (PEL).

(2007 Ed.)

(2) Make sure medical evaluations are provided at reasonable times and places, and at no cost to employees.

**Note:** This includes travel costs and wages associated with any time spent obtaining the medical evaluation.

**You must:**

• Provide the LHCP the following information before the medical evaluation is performed:

– The name of the hazardous chemicals the employee may have been exposed to.

– Any signs or symptoms of exposure the employee has.

– A description of the conditions under which the exposure occurred.

– The exposure monitoring results for the conditions, if available.

• Obtain the LHCP's written opinion for each medical evaluation that includes the following:

– Recommendations for medical follow-up.

– Any medical conditions found that would increase the employee's risk for impairment from exposure to a hazardous chemical.

– A statement that the employee has been informed of exposure-related medical results and conditions that require further examination or treatment.

– A written opinion that does not contain any medical information unrelated to the employee's occupational exposures.

■ If the written opinion contains any medical information unrelated to occupational exposures, return it to the LHCP and obtain a revised version without the additional medical information.

**Reference:** • For additional requirements relating to employee medical records, go to Access to records, chapter 296-802 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-20030, filed 1/3/06, effective 4/1/06.]

**WAC 296-828-300 Definitions.**

**Action level**

An airborne concentration of a hazardous substance that is calculated as an 8-hour time-weighted average, and initiates certain requirements to be followed such as exposure monitoring or medical surveillance.

**Carcinogens see "select carcinogen"**

**Chemical hygiene officer**

An employee designated by the employer who is qualified by training or experience to provide technical guidance in the development and implementation of the chemical hygiene plan. This definition is not intended to place limitations on the designated employee's position description or job classification within the employer's organization.

**Chemical hygiene plan**

A written program developed and implemented by the employer that establishes procedures, equipment, personal protective equipment, and work practices to protect employees from the health hazards of the chemicals used in the laboratory.

**Container**

Any container, except for pipes or piping systems that contains a hazardous substance. For example it can be any of the following:

- Barrel.
- Bottle.

- Can.
- Cylinder.
- Drum.
- Reaction vessel.
- Storage tank.

**Day**

Any part of a calendar day.

**Designated representative**

Any one of the following:

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written employee authorization.
- The legal representative of a deceased or legally incapacitated employee.

**Emergency**

Any event that could or does result in the unexpected, significant release of a hazardous substance. Examples of emergencies include equipment failure, container rupture, or control equipment failure.

**Exposure**

The contact an employee has with a hazardous substance, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

**Hazardous chemical**

A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

**Laboratory**

A facility where the "laboratory use of hazardous substances" takes place. A workplace where relatively small amounts of hazardous substances are used on a nonproduction basis.

**Laboratory-type hood**

A device located in a laboratory, enclosure on five sides with a moveable sash or fixed partial enclosed on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

**Note:** Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous substances.

**Laboratory scale**

Work with substances in which the containers used for reactions, transfers and other handling of the substances are designed to be easily and safely manipulated by one person. "Laboratory scale" **does not** include workplaces producing commercial quantities of materials.

**Laboratory use**

The handling or use of hazardous substances that includes **all** the following:

- Chemical manipulations conducted on a "laboratory scale."
- Multiple chemical procedures or chemicals are used.
- The procedures are not part of a production process, nor in any way simulate a production process.
- "Protective laboratory practices and equipment" are available and are commonly used to minimize the potential for employee exposures to hazardous substances.

**Licensed healthcare professional (LHCP)**

An individual whose legally permitted scope of practice allows him or her to provide some or all of the healthcare services required for medical evaluations.

**Material safety data sheet (MSDS)**

Written, printed, or electronic information (on paper, microfiche, or on-screen) that informs manufacturers, distributors, employers or employees about a hazardous substance, its hazards, and protective measures as required by material safety data sheet and label preparation, chapter 296-839 WAC.

**Permissible exposure limits (PELs)**

PELs are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are also specified in WISHA rules found in other chapters.

**Physical hazard**

As used in Employer chemical hazard communication, WAC 296-800-170 means a chemical that has scientifically valid evidence to show it is one of the following:

- Combustible liquid.
- Compressed gas.
- Explosive.
- Flammable.
- Organic peroxide.
- Oxidizer.
- Pyrophoric.
- Unstable (reactive).
- Water reactive.

**Protective laboratory practices and equipment**

Laboratory procedures, practices, and equipment accepted by laboratory health and safety experts as effective, that can be shown to be effective, in minimizing the potential for employee exposure to hazardous substances.

**Reproductive toxin**

Chemicals that affect reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

**Select carcinogen**

Any substance meeting one of the following criteria:

- Regulated by WISHA as a carcinogen.
- Listed in the "know to be carcinogens" category in the latest edition of the Annual Report on Carcinogens by the National Toxicity Program (NTP).
- Listed in Group I (carcinogenic to humans) in the latest editions of the International Agency for Research on Cancer (IARC) Monographs.
- Listed in either group 2A or 2B by IARC **or** in the category "reasonably anticipated to be carcinogens" by the NTP, and causes statistically significant tumor incidence in experi-

mental animals in accordance with any of the following criteria:

- After an inhalation exposure of six to seven hours a day; five days a week; for a significant portion of a lifetime to dosages of less than 10 mg/m<sup>3</sup>; **or**
- After repeated skin application of less than 300 mg/kg of body weight per week; **or**
- After oral dosages of less than 50 mg/kg of body weight per day.

**Time-weighted average (TWA<sub>8</sub>)**

An exposure limit averaged over an 8-hour period that must not be exceeded during an employee's workday.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-828-300, filed 1/3/06, effective 4/1/06.]

**Chapter 296-829 WAC****HELICOPTERS USED AS LIFTING MACHINES****WAC**

296-829-100	Scope.
296-829-200	Design and installation requirements for helicopters.
296-829-20005	Follow Federal Aviation Administration (FAA) requirements.
296-829-20010	Install and test hooks on helicopters correctly.
296-829-300	Maintenance.
296-829-30005	Keep landing and deposit areas safe.
296-829-30010	Follow safe refueling procedures.
296-829-400	Operating the helicopter.
296-829-40005	Hold daily briefings.
296-829-40010	Make sure employees are dressed correctly.
296-829-40015	Make sure loads are attached correctly.
296-829-40020	Make sure the load is handled correctly.
296-829-500	Definitions.

**WAC 296-829-100 Scope.** Chapter 296-829 WAC applies to helicopters when used to carry loads, suspended with a cargo sling, powered hoist, or other attaching methods.

**Exemption:** This chapter does not apply to the use of helicopters:

- In the logging industry.
- For rescue operations when a winch or hoist is used.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-09-099, § 296-829-100, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-200 Design and installation requirements for helicopters.**

**Summary:****Your responsibility:**

To make sure your helicopters meet design specifications and are equipped properly.

**You must:**

Follow Federal Aviation Administration (FAA) requirements

WAC 296-829-20005.

Install and test hooks on helicopters correctly

WAC 296-829-20010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-09-099, § 296-829-200, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-20005 Follow Federal Aviation Administration (FAA) requirements.**

**You must:**

• Make sure helicopter cranes and their use meet the applicable requirements of the Federal Aviation Administration (FAA).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-20005, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-20010 Install and test hooks on helicopters correctly.**

**You must:**

- Make sure electrically operated cargo hooks are:
  - Designed and installed to prevent accidental operation.
  - Equipped with an emergency mechanical control to release the load.
- Make sure a competent person tests all hooks before each day's operation to make sure both the electrical and mechanical releases work properly.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-20010, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-300 Maintenance.**

**Summary:**

**Your responsibility:**

To keep helicopters in safe operating condition.

**You must:**

Keep landing and deposit areas safe  
 WAC 296-829-30005.  
 Follow safe refueling procedures  
 WAC 296-829-30010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-300, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-30005 Keep landing and deposit areas safe.**

**You must:**

(1) Make sure precautions are taken to prevent loose objects from being caught in the downwash and flying around.

- Secure or remove all loose gear:
  - Within one hundred feet of lift and deposit areas.
  - In all other areas affected by rotor downwash.

(2) Make sure employees do not work under hovering craft, except where necessary to hook or unhook loads.

(3) Make sure safe access and exit, including an emergency escape route, is provided for employees who hook or unhook loads.

(4) Prohibit open fires in any area that could be affected by the rotor downwash.

(5) Make sure unauthorized people do not go within fifty feet of the helicopter when the rotor blades are turning.

(6) Make sure all employees:

- Stay in full view of the pilot, in a crouched position, when approaching or leaving a helicopter with rotating blades.

- Stay away from the area behind the cockpit or cabin unless the operator authorizes them to work there.

(7) Take precautions to eliminate reduced visibility.

(8) Make sure ground personnel take special care to stay clear of rotors when visibility is reduced by dust or other conditions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-30005, filed 4/20/04, effective 9/1/04.]

(2007 Ed.)

**WAC 296-829-30010 Follow safe refueling procedures.**

**You must:**

- Make sure refueling areas are safe.
  - Post "NO SMOKING" signs at all entrances to the refueling area.
  - Provide at least one thirty-pound fire extinguisher, or a combination totaling thirty pounds, good for class A, B, and C fires, within one hundred feet on the upwind side of the refueling operation.

**Reference:** For additional requirements relating to portable fire extinguishers, see WAC 296-800-300 in the safety and health core rules.

**You must:**

• Make sure workers involved in refueling are trained in both:

- The refueling operation;

**AND**

– The use of fire extinguishing equipment they may need.

• Make sure the following precautions are taken before and during refueling:

- Keep unauthorized people at least fifty feet away from the refueling operation or equipment.
- Prohibit smoking and open flames within fifty feet of the refueling area or fueling equipment.

– Make sure helicopter engines are shut down before refueling, if using aviation gasoline or jet B type fuel.

– Pump fuel, either by hand or power.

– Use self-closing nozzles or deadman controls:

■ Do not allow these to be blocked open.

– Make sure nozzles are not dragged along the ground.

– Make sure the helicopter and the fueling equipment are grounded.

– Electrically bond the fueling nozzle to the helicopter:

■ Do not use conductive hose for this bonding.

– Make sure all grounding and bonding connections are:

■ Electrically and mechanically firm.

■ On clean unpainted metal parts.

• Stop fueling **immediately** if there is a spill:

– Do not continue operation until the person in charge has determined it is safe.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-30010, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-400 Operating the helicopter.**

**Summary:**

**Your responsibility:**

To make sure helicopters are operated safely.

**You must:**

Hold daily briefings

WAC 296-829-40005.

Make sure employees are dressed correctly

WAC 296-829-40010.

Make sure loads are attached correctly

WAC 296-829-40015.

Make sure the load is handled correctly

WAC 296-829-40020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-400, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-40005 Hold daily briefings.****You must:**

- Make sure the helicopter pilot and ground personnel hold a briefing before each day's operation to discuss cargo-handling plans.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-40005, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-40010 Make sure employees are dressed correctly.****You must:**

- Make sure employees receiving the load:
  - Do NOT wear loose-fitting clothes that could snag on the hoist line.
  - Wear personal protective equipment (PPE), including complete eye protection and hard hats that are secured by chin straps.

**Reference:** For other requirements relating to PPE, see WAC 296-800-160 in the safety and health core rules.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-40010, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-40015 Make sure loads are attached correctly.****You must:**

- Make sure loads are properly slung so tag lines cannot be drawn up into rotors.
- Make sure precautions are taken on all freely suspended loads to keep hand splices from spinning open or

cable clamps from loosening, such as using pressed sleeves or swaged eyes.

- Make sure the weight of the load does not exceed the manufacturer's load ratings.
- Make sure hoist wires and other gear are **not** attached to or allowed to catch on any fixed structure.

**Exemption:** This requirement does not apply to pulling lines or conductors that "pay out" from a container or reel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-09-099, § 296-829-40015, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-40020 Make sure the load is handled correctly.****You must:**

- Make sure signal systems, whether radio or hand signals, are checked before hoisting the load:
    - When using hand signals, use those shown in Figure 1.
  - Make sure workers on the ground do **either** of the following before touching the suspended load:
    - Use a ground device to safely discharge any static charge;
- OR**
- Put on and wear rubber gloves.
  - Make sure there are enough employees for safe loading and unloading operations.
  - Make sure constant communications are maintained between the pilot and signal person:
    - The signal person must be distinctly recognizable from other ground personnel.

**HELICOPTER HAND SIGNALS****MOVE RIGHT**

Left arm extended horizontally; right arm sweeps upward to position over.

**HOLD HOVER**

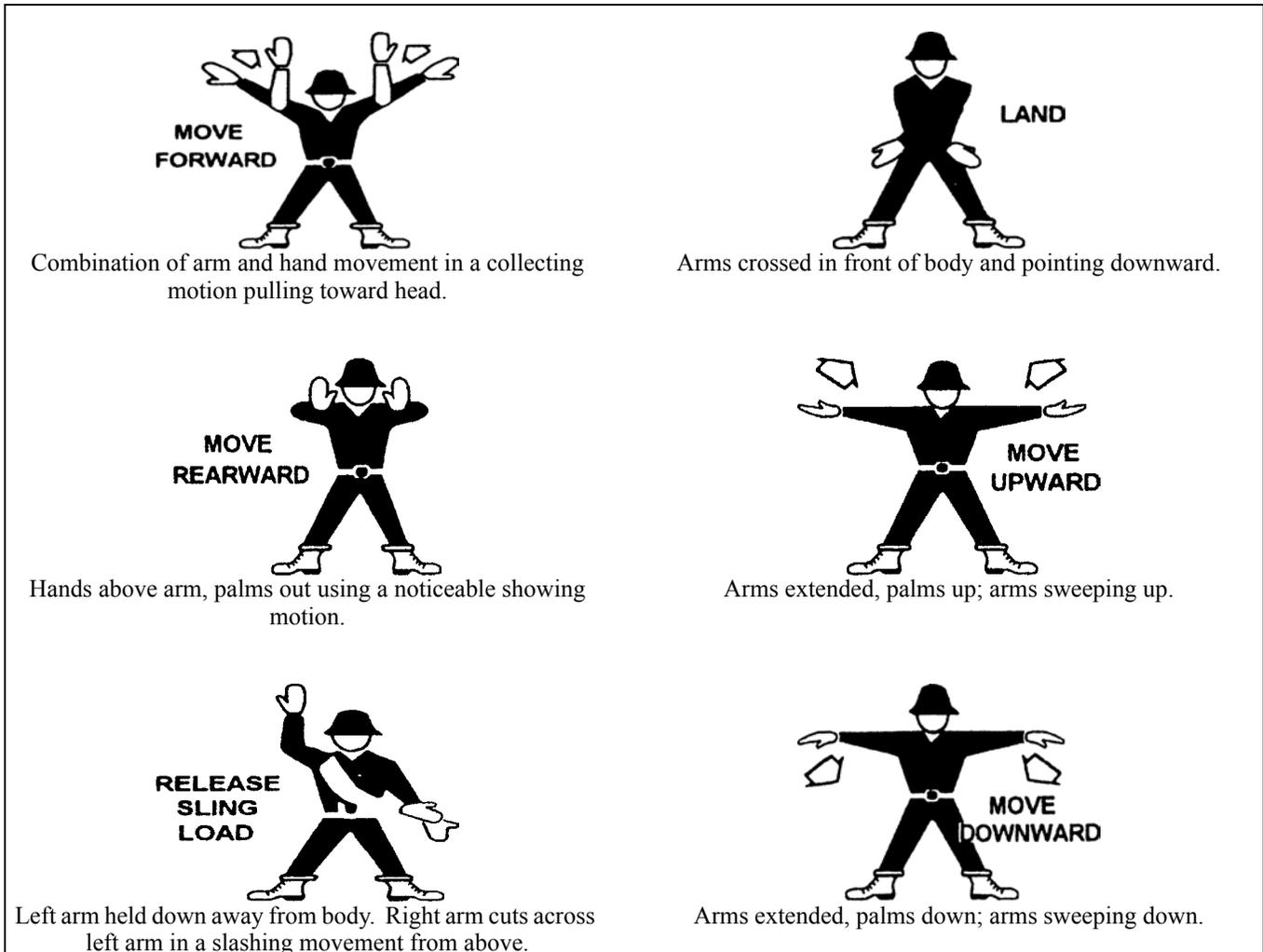
The signal "Hold" is executed by placing arms over head with clenched fists.

**MOVE LEFT**

Right arm extended horizontally; left sweeps upward to position over head.

**TAKEOFF**

Right hand behind back; left hand pointing up.



[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-09-099, § 296-829-40020, filed 4/20/04, effective 9/1/04.]

**WAC 296-829-500 Definitions.**

**Aviation gasoline**

Gasoline fuel for reciprocating piston engine helicopters, also known as avgas.

**Cargo hook**

A device attached to a helicopter that is used to hold suspended loads.

**Competent person**

One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

**Deadman controls**

A control, switch or device that will automatically shut off whenever the operator releases it.

**Deposit area**

An area that is designated for dropping off and picking up suspended loads.

**Downwash**

The wind created by the rotating blades of a helicopter.

**Ground device**

A device used to dissipate the static electricity charge that has built up on a suspended load.

**Helicopter crane**

A helicopter that carries cargo or equipment suspended underneath it.

**Jet A type fuel**

A kerosene grade fuel suitable for helicopters with turbine engines.

**Jet B type fuel**

A blend of gasoline and kerosene fuel.

**Powered hoist**

A powered device designed to lift and lower equipment and cargo.

**Tag line**

A line or rope used to control suspended loads that can swing freely.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-09-099, § 296-829-500, filed 4/20/04, effective 9/1/04.]

**Chapter 296-832 WAC**

**LATE NIGHT RETAIL WORKER CRIME PREVENTION**

**WAC**

296-832-100  
296-832-200

Scope.  
Training.

296-832-20005	Provide crime prevention training to your employees.
296-832-20010	Provide crime prevention retraining to your employees annually.
296-832-300	Store safety.
296-832-30005	Have a safe in your store.
296-832-30010	Post a notice about your store's safe and cash register.
296-832-30015	Provide outside lighting.

**WAC 296-832-100 Scope.** This rule applies to all retail businesses operating between the hours of 11:00 p.m. and 6:00 a.m.

**Exemption:** This chapter does not apply to restaurants, hotels, taverns, and lodging facilities.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-16-087, § 296-832-100, filed 8/7/02, effective 10/1/02.]

### WAC 296-832-200 Training.

#### SUMMARY

#### Your responsibility:

To make sure all employees receive crime prevention training as part of your accident prevention program.

#### You must:

Provide crime prevention training to your employees

WAC 296-832-20005

Provide crime prevention retraining to your employees annually

WAC 296-832-20010.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-16-087, § 296-832-200, filed 8/7/02, effective 10/1/02.]

### WAC 296-832-20005 Provide crime prevention training to your employees.

**Note:** These training requirements apply only to employees working any time during the hours of 11:00 p.m. to 6:00 a.m. This training must be conducted prior to the employee working this time period.

#### You must:

- Provide crime prevention training as part of your accident prevention program.
  - Make sure you have instructed your employees on the purpose and function of robbery and violence prevention to provide them with the knowledge and skills required to maintain their personal safety.

- Provide training and training materials that outline your company's:
  - Security policies
  - Safety and security procedures
  - Personal safety and crime prevention techniques.

- Provide formal instruction about crime prevention through a training seminar or training video presentation that includes these topics:
  - How keeping the store clean, neat and uncluttered discourages potential robbers
  - Why the cash register should be kept in plain view from outside the store, if your store layout allows
  - Reasons for operating your business with only a minimum number of cash registers at night
  - Reasons for keeping cash register funds to a minimum
  - How to take extra precautions after dark such as ways to keep alert, making sure appropriate lights are on, inspecting dark corners, and identifying possible hiding places for robbers
  - Violence prevention procedures in case of a robbery.

- Have employees sign a statement indicating the date, time, and place they received their crime prevention training.
- Keep a record of this information readily available for review when requested by the department of labor and industries.

**Note:** Employers may keep electronic records of employee training and verification.

- Have a videotape or other materials about crime prevention available to all employees at their request.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-16-087, § 296-832-20005, filed 8/7/02, effective 10/1/02.]

### WAC 296-832-20010 Provide crime prevention retraining to your employees annually.

#### You must:

- Provide a refresher course in crime prevention training annually.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-16-087, § 296-832-20010, filed 8/7/02, effective 10/1/02.]

### WAC 296-832-300 Store safety.

#### SUMMARY

#### Your responsibility:

To take certain safety measures to discourage crime in your store.

#### You must:

Have a safe in your store

WAC 296-832-30005

Post a notice about your store's safe and cash register

WAC 296-832-30010

Provide outside lighting

WAC 296-832-30015.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-16-087, § 296-832-300, filed 8/7/02, effective 10/1/02.]

### WAC 296-832-30005 Have a safe in your store.

#### You must:

- Have a drop-safe, limited access safe, or comparable device in your store.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050, and [49.17].060. 02-16-087, § 296-832-30005, filed 8/7/02, effective 10/1/02.]

### WAC 296-832-30010 Post a notice about your store's safe and cash register.

#### You must:

- Post a notice in an obvious place on a window or door stating:
  - There is a safe in the store
  - Employees have no access to the safe
  - The cash register contains only enough cash to do business.

### WAC 296-832-30015 Provide outside lighting.

#### You must:

- Light the store's approach area and parking lot during all night hours your business is open.

**Note:** You can do this by:  
 – Providing surveillance lighting to observe pedestrian and vehicle entrances  
 – Providing lighting of a minimum of one foot candle to comply with ANSI/IES RP7-1983. Lighting levels can be measured with a light meter; for comparison purposes 1 foot-candle = 1 lumen incident per square foot = 10.76 lux.

[Statutory Authority: RCW 49.17.010, [49.17.]040, [49.17.]050, and [49.17.]060. 02-16-087, § 296-832-30015, filed 8/7/02, effective 10/1/02.]

**Chapter 296-833 WAC  
 TEMPORARY HOUSING FOR WORKERS**

<b>WAC</b>	
296-833-100	Scope.
296-833-10010	Summary.
296-833-200	Shelter location and structure requirements.
296-833-20005	Provide and maintain sufficient grounds and open areas in temporary housing sites.
296-833-20010	Follow these design and equipment requirements for shelters.
296-833-300	Utilities employers must provide.
296-833-30005	Provide electricity and lighting to temporary housing areas.
296-833-30010	Provide adequate water.
296-833-30015	Provide toilet facilities.
296-833-30020	Follow local regulations for sewage disposal.
296-833-400	Service facilities: Food preparation, dining, bathing, laundry and handwashing.
296-833-40005	Provide service buildings for laundry, handwashing and bathing.
296-833-40010	Provide cooking, food-handling, and dining facilities.
296-833-500	Waste disposal and pest control.
296-833-50005	Follow proper waste disposal procedures.
296-833-50010	Control insects, rodents, and other pests.
296-833-600	Employee first aid and communicable disease reporting.
296-833-60005	Provide first-aid facilities.
296-833-60010	Report communicable diseases.

**WAC 296-833-100 Scope.** This chapter applies to all employers who provide or require their employees to live in temporary housing.

**Exemption:**

This rule does not apply to the agriculture industry.

For agriculture employers, see WAC 296-307-161, Temporary worker housing, and WAC 296-307-163, Cherry harvest camps.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-100, filed 11/19/02, effective 1/1/03.]

**WAC 296-833-10010 Summary.**

**Your responsibility:**

If you choose to provide temporary housing for workers, or require them to live on the grounds in housing they provide themselves, you must make sure the housing facilities meet the requirements of this rule.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-10010, filed 11/19/02, effective 1/1/03.]

**WAC 296-833-200 Shelter location and structure requirements.**

**Summary.**

**Your responsibility:**

To provide and maintain safe and healthful housing for your temporary workers.

**You must:**

Provide and maintain sufficient grounds and open areas in temporary housing sites

WAC 296-833-20005

Follow these design and equipment requirements for shelters

WAC 296-833-20010.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-200, filed 11/19/02, effective 1/1/03.]

**WAC 296-833-20005 Provide and maintain sufficient grounds and open areas in temporary housing sites.**

**You must:**

(1) Make sure that all temporary housing sites:

- Are adequately drained and are free from ground depressions in which water may accumulate

- Have no history of flooding

- Do not endanger any domestic or public water supply with their drainage

- Are located at least two hundred feet from a swamp, pool, sink hole, or other surface collection of water unless the water surface can be treated for mosquito control.

(2) Make sure the housing area is large enough to prevent the buildings from being crowded too closely together.

(3) Make sure the principal housing areas for sleeping and food preparation/eating are at least five hundred feet from livestock operations.

**Note:** Livestock operations include, among other things, dairy farms, corrals, slaughterhouses, feedlots, and stockyards. Operations where livestock can roam on a pasture over a distance may be treated as outside the definition.

(4) Make sure that grounds and open areas surrounding the shelters are maintained in a clean and sanitary condition.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-20005, filed 11/19/02, effective 1/1/03.]

**WAC 296-833-20010 Follow these design and equipment requirements for shelters.**

**You must:**

(1) Make sure that every shelter in the camp provides protection against the elements.

(2) Make sure each dwelling unit:

- Has at least seventy square feet of floor space for the first occupant and at least fifty square feet of floor space for each additional occupant

- That is designated a family unit has a separate sleeping area for children over six years old

- With designated sleeping room(s) has at least fifty square feet of floor space in the sleeping room for each occupant

- Has at least a seven-foot ceiling

- Has windows:

- Covering a total area equal to at least one-tenth of the floor area

AND

- At least one-half of which can be opened for ventilation

- Has each exterior opening screened with 16-mesh material

- Has screen doors with self-closing devices.

(3) Make sure that the floors of each shelter are constructed of wood, asphalt, or concrete.

- Floors must be kept in good repair
- If wooden floors are used, they must be:
  - Elevated one foot above ground level at all points to prevent dampness and to permit free air circulation
  - Smooth and tight.

**Note:** You may "bank" around outside walls with earth or other suitable material to guard against extreme low temperatures.

(4) Provide beds, cots, or bunks, and suitable storage facilities such as wall lockers for clothing and personal articles in every sleeping room.

- Beds must be at least thirty-six inches away from other beds, both side to side and end to end
- The frame of the bed must keep mattresses at least twelve inches off the floor
- Double-deck bunks must be spaced at least forty-eight inches away from other beds, both side to side and end to end
- The minimum clear space between lower and upper bunks must be at least twenty-seven inches
- Triple-deck bunks are not allowed.

(5) Provide equipment that adequately heats the living area whenever the camp is used during cold weather.

**Note:** All heating, cooking, and water heating equipment must meet state and local ordinances, codes, and regulations concerning installation.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-20010, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-300 Utilities employers must provide. Summary.**

##### **Your responsibility:**

To provide utilities to your temporary housing camps.

##### **You must:**

Provide electricity and lighting to temporary housing areas

WAC 296-833-30005

Provide adequate water

WAC 296-833-30010

Provide toilet facilities

WAC 296-833-30015

Follow local regulations for sewage disposal

WAC 296-833-30020.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-300, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-30005 Provide electricity and lighting to temporary housing areas.**

##### **You must:**

(1) Supply electricity to all:

- Dwelling units
- Kitchen facilities
- Shower/bathroom facilities
- Common areas
- Laundry facilities.

##### **Reference:**

You need to follow additional requirements for electricity and lighting. See WAC 296-800-280, Basic electrical rules, in the safety and health core rules book for more information.

(2) Provide lighting to camp buildings.

- Make sure general lighting and task lighting are adequate for normal daily activities
- Make sure living quarters have:
  - One ceiling-type light fixture

##### **AND**

- One separate floor or wall convenience outlet.
- Make sure laundry rooms, toilet rooms, and other common areas have at least:
  - One ceiling light fixture

##### **OR**

- A wall light fixture.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-30005, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-30010 Provide adequate water.**

##### **You must:**

- Provide a water supply that is adequate and convenient for:

- Drinking
- Cooking
- Bathing
- Laundry purposes.

- Make sure the water supply system is:

- Capable of delivering
  - Thirty-five gallons per person per day to the campsite
  - At a peak rate of two and one-half times the average hourly demand

– Able to supply water to all fixtures at the same time with normal operating pressures

- Approved by the appropriate health authority
- Supply water to each housing area by either:
  - Piping water directly to the shelters
  - Providing yard hydrants within one hundred feet of the shelters

- Prohibit common drinking cups

- Provide one or more drinking fountain(s) for each one hundred occupants (or fraction of that number) where water under pressure is available.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-05-027, § 296-833-30010, filed 2/7/06, effective 4/1/06; 02-23-073, § 296-833-30010, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-30015 Provide toilet facilities.**

**Note:** For the purposes of this rule, a restroom is a room maintained on the premises for use by employees that contains a toilet. This includes outhouses.

##### **You must:**

(1) Provide enough toilets for the camp's capacity.

- Toilets and outhouses must be provided in a ratio of one for every fifteen people, with a minimum of two units for any facility shared by men and women.

**Note:** Check with your local jurisdictions for regulations regarding outhouses.

(2) Have enough rest rooms for each sex based on the maximum number of persons the camp is designed to house at any one time.

(3) Provide separate rest rooms for each sex wherever rest rooms are in buildings shared by men and women.

- Distinctly mark the rooms "men" and "women" with:

– Signs printed in English and in the native language of the persons occupying the camp

**OR**

– Easily understood pictures or symbols.

• If the facilities for each sex are in the same building, they must be separated by:

– Solid walls

**OR**

– Partitions extending from the floor to the roof or ceiling.

(4) Make sure:

• No one has to pass through a sleeping room to reach a rest room

• Rest rooms have a window of at least six square feet opening directly to the outside, or are satisfactorily ventilated

• All outside openings are screened with 16-mesh material

• Fixtures, toilets, chemical toilets, or urinals are not located in a room used for other than toilet purposes

• A rest room is within two hundred feet of the door of each sleeping room

• Any outhouse is at least one hundred feet away from any sleeping room, dining room, lunch area, or kitchen.

(5) Provide urinals as follows:

• One urinal or two linear feet of urinal trough for each twenty-five men

• Construct the floor out of materials that are moisture proof, from the wall and out at least fifteen inches from the outer edge of the urinals

• Have an adequate water flush in urinals when water under pressure is available

• Urinal troughs in outhouses must:

– Drain freely into the pit or vault

**AND**

– Have a drain constructed to exclude flies and rodents from the pit.

(6) Install any new toilets in a rest room.

(7) Make sure:

• There is an adequate supply of toilet paper for each rest room, outhouse, or chemical toilet

• Toilet facilities are:

– Kept in sanitary condition

**AND**

– Cleaned at least daily.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-30015, filed 11/19/02, effective 1/1/03.]

### **WAC 296-833-30020 Follow local regulations for sewage disposal.**

**You must:**

• Provide sewage disposal systems according to local health jurisdictions.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-30020, filed 11/19/02, effective 1/1/03.]

### **WAC 296-833-400 Service facilities: Food preparation, dining, bathing, laundry and handwashing.**

**Summary.**

**Your responsibility:**

To provide facilities for your employees to cook, eat, do laundry, bathe, and wash their hands.

(2007 Ed.)

**You must:**

Provide service buildings for laundry, handwashing and bathing

WAC 296-833-40005

Provide cooking, food-handling, and dining facilities

WAC 296-833-40010.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-400, filed 11/19/02, effective 1/1/03.]

### **WAC 296-833-40005 Provide service buildings for laundry, handwashing and bathing.**

**You must:**

(1) Make sure that every service building has equipment capable of maintaining a room temperature of at least seventy degrees Fahrenheit.

(2) Make sure an adequate supply of hot and cold running water is provided for bathing and laundry purposes.

(3) Provide:

• One handwash basin

– Per family shelter

**OR**

– Per six persons in shared facilities

• One shower head for every ten persons

• One laundry tray or tub for every thirty persons

• One "deepwell" type sink in each building used for laundry, handwashing, and bathing.

(4) Make sure all:

• Laundry, handwashing and bathing room floors:

– Are moisture-resistant and smooth but not slippery

– Have coved junctions of the curbing and the floor

• Walls and partitions of shower rooms are smooth and moisture-resistant to the height where water splashes.

• Shower baths, shower rooms, or laundry rooms have floor drains to remove wastewater and facilitate cleaning.

(5) Provide facilities for drying clothes.

(6) Keep all service buildings clean.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-40005, filed 11/19/02, effective 1/1/03.]

### **WAC 296-833-40010 Provide cooking, food-handling, and dining facilities.**

**You must:**

(1) Make sure common cooking and dining areas are of adequate size and are separated from sleeping areas by a door.

(2) Provide enclosed and screened cooking and food-handling facilities for all occupants. The facilities must include:

• A working cook stove or hot plate with at least one cooking surface for every two occupants

• A sink with hot and cold running potable water under pressure

• Food storage areas located off the floor

• Nonabsorbent, easily cleanable food preparation counters

• Mechanical refrigeration capable of maintaining a temperature of forty-five degrees Fahrenheit or below, with enough space to store perishable food items for all occupants

• Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings close to cooking areas

• Nonabsorbent, easily cleanable floors

[Title 296 WAC—p. 2909]

- At least one ceiling or wall light fixture
  - Lighting adequate for normal food preparation activities
  - Adequate ventilation for cooking facilities.
- (3) Make sure that dining halls:
- Meet the requirements of the department of health's rules in chapter 246-215 WAC, Food service
  - Have no direct openings to living or sleeping areas
  - Have fire-resistant, nonabsorbent, nonasbestos, and easy-to-clean wall coverings adjacent to cooking areas
  - Have nonabsorbent, easy-to-clean floors
  - Have at least one ceiling or wall light fixture
  - Have lighting adequate for normal dining activities.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-40010, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-500 Waste disposal and pest control.**

##### **Summary.**

##### **Your responsibility:**

To make sure your temporary housing camps are kept sanitary.

##### **You must:**

Follow proper waste disposal procedures

WAC 296-833-50005

Control insects, rodents, and other pests

WAC 296-833-50010.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-500, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-50005 Follow proper waste disposal procedures.**

##### **You must:**

- Provide at least one garbage container for each family shelter. Garbage containers must be:
  - Placed on a wooden, metal, or concrete pad
- AND
- Located within one hundred feet of each shelter.
- Provide garbage containers that:
  - Are nonabsorbent
  - Are cleanable **OR** only used once (for example, a disposable plastic liner)
  - Can be securely closed.
- Make sure garbage containers are kept clean and emptied:
  - At least twice a week
- AND
- When full.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-50005, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-50010 Control insects, rodents, and other pests.**

##### **You must:**

- Take steps to effectively prevent insects, rodents, and other pests from infesting camp areas
- Carry out a continuing and effective control program where pests have been detected.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-50010, filed 11/19/02, effective 1/1/03.]

[Title 296 WAC—p. 2910]

#### **WAC 296-833-600 Employee first aid and communicable disease reporting.**

##### **Summary.**

##### **Your responsibility:**

To guard the general health of your employees by providing first-aid facilities and reporting communicable diseases.

##### **You must:**

Provide first-aid facilities

WAC 296-833-60005

Report communicable diseases

WAC 296-833-60010.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-600, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-60005 Provide first-aid facilities.**

##### **You must:**

- Provide and maintain adequate first-aid facilities

AND

- Make sure a person trained in first aid is in charge of the first-aid facilities.

##### **Reference:**

See WAC 296-800-150, First aid, in the core rules book for requirements for first-aid training and supplies.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-60005, filed 11/19/02, effective 1/1/03.]

#### **WAC 296-833-60010 Report communicable diseases.**

##### **You must:**

- Immediately report to the local health officer:
  - The name and address of any individual in the camp known to or suspected of having a communicable disease listed in the department of health's list of notifiable conditions, chapter 246-101 WAC
  - Any suspected food poisoning
  - Any unusual occurrence of:
    - Fever
    - Diarrhea
    - Sore throat
    - Vomiting
    - Jaundice.

[Statutory Authority: RCW 49.17.010, 49.[17.]040, 49.[17.]050, and 49.[17.]060. 02-23-073, § 296-833-60010, filed 11/19/02, effective 1/1/03.]

### **Chapter 296-835 WAC**

#### **DIPPING AND COATING OPERATIONS (DIP TANKS)**

##### **WAC**

296-835-100 Scope.

296-835-110 General requirements.

##### **CONSTRUCTION**

296-835-11005 Construct safe dip tanks.

##### **VENTILATION**

296-835-11010 Provide proper ventilation for the vapor area.

296-835-11015 Take additional precautions if you recirculate ventilation system exhaust air into the workplace.

296-835-11020 Take additional precautions when using an exhaust hood.

INSPECTION

296-835-11025 Periodically inspect your dip tanks and associated equipment and correct any deficiencies.

FIRST AID

296-835-11030 Make sure employees working near dip tanks know appropriate first-aid procedures.

CLEANING

296-835-11035 Prepare dip tanks before cleaning.

CYANIDE

296-835-11040 Safeguard cyanide tanks.

WELDING

296-835-11045 Protect employees during welding, burning, or other work using open flames.

LIQUIDS HARMFUL TO SKIN

296-835-11050 Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.

296-835-120 Additional requirements for dip tanks using flammable or combustible liquids.

CONSTRUCTION

296-835-12005 Include additional safeguards when constructing dip tanks.

296-835-12010 Provide overflow pipes.

296-835-12015 Provide bottom drains.

FIRE PROTECTION

296-835-12020 Provide fire protection in the vapor area.

296-835-12025 Provide additional fire protection for large dip tanks.

ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION

296-835-12035 Prevent static electricity sparks or arcs when adding liquids to a dip tank.

296-835-12040 Control ignition sources.

296-835-12045 Provide safe electrical wiring and equipment where the liquid can drip or splash.

HOUSEKEEPING

296-835-12050 Keep the area around dip tanks clear of combustible material and properly dispose of waste.

HEATING LIQUID

296-835-12055 Make sure heating the liquid in your dip tanks does not cause a fire.

HEAT DRYING

296-835-12060 Make sure a heating system used for drying objects does not cause a fire.

CONVEYORS

296-835-12065 Make sure conveyor systems are safe.

296-835-130 Additional requirements for dip tanks used for specific processes.

HARDENING OR TEMPERING

296-835-13005 Meet specific requirements if you use a hardening or tempering tank.

ELECTROSTATIC EQUIPMENT

296-835-13010 Meet specific requirements if you use electrostatic equipment.

FLOW COATING

296-835-13015 Meet specific requirements if you use a flow coating process.

ROLL COATING

296-835-13020 Take additional precautions if your roll coating operation uses a liquid that has a flashpoint below 140°F (60°C).

VAPOR DEGREASING

296-835-13025 Provide additional safeguards for vapor degreasing tanks.

SPRAY CLEANING OR DEGREASING

296-835-13030 Control liquid spray over an open surface cleaning or degreasing tank.

296-835-140 Definitions.

**WAC 296-835-100 Scope.**

**IMPORTANT:**

A **dip tank** is a container holding a liquid other than plain water that is used for dipping or coating. An object may be completely or partially immersed (in a dip tank) or it may be suspended in a vapor coming from the tank.

**Exemption:** Dip tanks that use a molten material (molten metal, alloy, salt, etc.) are not covered by this chapter.

This chapter **applies** to:

- A dip tank that uses a liquid other than plain water, or the vapor of the liquid, to:

- Clean an object
- Coat an object
- Alter the surface of an object

**OR**

- Change the character of an object.

- Draining or drying an object that has been dipped or coated.

Examples of covered dipping and coating operations include, but are not limited to:

- Paint dipping
- Electroplating
- Anodizing
- Pickling
- Quenching
- Tanning
- Degreasing
- Stripping
- Cleaning
- Dyeing
- Flow coating
- Roll coating.

**Reference:** You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See personal protective equipment (PPE), WAC 296-800-160, in the core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-100, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-110 General requirements. Summary.**

**Your responsibility:**

Safeguard employees working with dip tanks.

**You must:**

**CONSTRUCTION**

Construct safe dip tanks

WAC 296-835-11005

**VENTILATION**

Provide proper ventilation for the vapor area

WAC 296-835-11010

Take additional precautions if you recirculate ventilation system exhaust air into the workplace

WAC 296-835-11015

Take additional precautions when using an exhaust hood

WAC 296-835-11020

**INSPECTION**

Periodically inspect your dip tanks and associated equipment and correct any deficiencies

WAC 296-835-11025

**FIRST AID**

Make sure employees working near dip tanks know appropriate first-aid procedures

WAC 296-835-11030

**CLEANING**

Prepare dip tanks before cleaning

WAC 296-835-11035

**CYANIDE**

Safeguard cyanide tanks

WAC 296-835-11040

**WELDING**

Protect employees during welding, burning or other work using open flames

WAC 296-835-11045

**LIQUIDS HARMFUL TO SKIN**

Provide additional protection for employees working near dip tanks that use liquid that may burn, irritate, or otherwise harm the skin

WAC 296-835-11050.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-110, filed 7/17/02, effective 10/1/02.]

**CONSTRUCTION****WAC 296-835-11005 Construct safe dip tanks.****You must:**

- Make sure dip tanks, including any drain boards, are strong enough to support the expected load.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11005, filed 7/17/02, effective 10/1/02.]

**VENTILATION****WAC 296-835-11010 Provide proper ventilation for the vapor area.****You must:**

- Make sure mechanical ventilation meets the requirements of one or more of the following standards:

- NFPA 34-1995, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids

- ACGIH's "Industrial Ventilation: A Manual of Recommended Practice" (22nd ed., 1995)

- ANSI Z9.1-1971, Practices for Ventilation and Operation of Open-Surface Tanks and ANSI Z9.2-1979, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

**Note:** Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

**You must:**

- Limit the vapor area to the smallest practical space by using mechanical ventilation.

- Keep airborne concentration of any substance below twenty-five percent of its lower flammable limit (LFL).

- Make sure mechanical ventilation draws the flow of air into a hood or exhaust duct.

[Title 296 WAC—p. 2912]

- Have a separate exhaust system for each dip tank if the combination of substances being removed could cause a:

- Fire

- Explosion

**OR**

- Potentially hazardous chemical reaction.

**Reference:** You need to keep employee exposure within safe levels when the liquid in a dip tank creates an exposure hazard. See Air contaminants, WAC 296-62-075 through 296-62-07515.

**Note:** You may use a tank cover or material that floats on the surface of the liquid to replace or assist ventilation. The method or combination of methods you choose has to maintain the airborne concentration of the hazardous material and the employee's exposure within safe limits.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11010, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-11015 Take additional precautions if you recirculate ventilation system exhaust air into the workplace.****You must:**

- Only recirculate air that contains no substance at a concentration that could pose a health or safety hazard to employees.

- Make sure any exhaust system that recirculates air into the workplace:

- Passes the air through a device that removes contaminants

- Sounds an alarm and automatically shuts down the dip tank operation, if the vapor concentration of any substance in the exhaust air exceeds twenty-five percent of its LFL

- Monitors the concentration of vapor from flammable or combustible liquids with approved equipment.

**Note:**

- The LFL concentration in the air must be determined after the air passes through the air-cleaning device and before the air reenters the workspace.
- Most substances will pose a health hazard at a concentration far below twenty-five percent of its LFL.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11015, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-11020 Take additional precautions when using an exhaust hood.****You must:**

- Make sure each room with an exhaust hood has a source of outside air that:

- Enters the room in a way that will not interfere with the function of the hood

- Replaces at least ninety percent of the air taken in through the hood.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11020, filed 7/17/02, effective 10/1/02.]

**INSPECTION****WAC 296-835-11025 Periodically inspect your dip tanks and associated equipment and correct any deficiencies.****You must:**

- Inspect or test your dip tanks and associated equipment periodically, including:

- Covers

(2007 Ed.)

- Overflow pipes
- Bottom drains and valves
- Electrical wiring, equipment, and grounding connections
- Ventilating systems
- Fire extinguishing equipment
- Inspect the hoods and ductwork of the ventilation system for corrosion and damage and make sure the airflow is adequate:
  - At least quarterly during operation
  - Prior to operation after a prolonged shutdown
  - Promptly fix any deficiencies found.

**Note:**

- To assist you in tracking your inspections and actions taken from those inspections, you may want to keep a written record.
- It is recommended that inspections be at least quarterly even if the system is not operating. Depending on the chemicals in use more frequent inspection may be required.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11025, filed 7/17/02, effective 10/1/02.]

## FIRST AID

**WAC 296-835-11030 Make sure employees working near dip tanks know appropriate first-aid procedures.**

**You must:**

- Make sure your employees know the appropriate first-aid procedures for the hazards of your dipping and coating operations.

**Note:**

- First-aid procedures are contained in the Material Safety Data Sheet (MSDS) for the chemicals used in the dip tank.
- First-aid supplies appropriate for the hazards of the dipping or coating operation need to be located near the dip tank to be considered "readily available" as required by WAC 296-800-15020.

**Reference:** There are additional requirements that may include providing emergency washing facilities and employee training. See first aid, WAC 296-800-150, and employer chemical hazard communication, WAC 296-800-170, in the safety and health core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11030, filed 7/17/02, effective 10/1/02.]

## CLEANING

**WAC 296-835-11035 Prepare dip tanks before cleaning.**

**You must:**

- (1) Drain the contents of the tank and open any cleanout doors.
- (2) Ventilate the tank to clear any accumulated hazardous vapors.

**Reference:** There may be requirements that apply before an employee enters a dip tank. See Permit-required confined spaces, WAC 296-62-141 and safety procedures, chapter 296-24 WAC, Part A-4.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11035, filed 7/17/02, effective 10/1/02.]

(2007 Ed.)

## CYANIDE

**WAC 296-835-11040 Safeguard cyanide tanks.**

**You must:**

- Provide a dike or other safeguard(s) to prevent cyanide from mixing with an acid if a dip tank fails.

**Note:** This would also apply to spills or other means by which cyanide could come in contact with an acid in sufficient quantity to produce a hazardous gas.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11040, filed 7/17/02, effective 10/1/02.]

## WELDING

**WAC 296-835-11045 Protect employees during welding, burning, or other work using open flames.**

**You must:**

- Make sure the dip tank and the area around it are thoroughly cleaned of solvents and vapors before performing work involving:
  - Welding
  - Burning

OR

- Open flames

**OR**

- Open flames

**Reference:** There are additional requirements for this type of work. See Welding, cutting and brazing, chapter 296-24 WAC, Part I, and Respiratory protection, chapter 296-842 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-03-093, § 296-835-11045, filed 1/18/05, effective 3/1/05. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11045, filed 7/17/02, effective 10/1/02.]

## LIQUIDS HARMFUL TO SKIN

**WAC 296-835-11050 Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.**

**You must:**

- (1) Make sure washing facilities, including hot water, are available for every ten employees that work with dip tank liquids.

- (2) Satisfy medical requirements:
  - Make sure an employee with any small skin abrasion, cut, rash, or open sore receives treatment by a properly designated person.
  - Make sure an employee with a sore, burn, or other skin lesion that needs medical treatment, has a physician's approval before they perform their regular work.
  - Make sure employees who work with chromic acid receive periodic examinations of their exposed body parts, especially their nostrils.

**Note:**

- Periodic means on a yearly basis unless otherwise indicated.
- Any time chromic acid spills onto an employee's skin or their clothing is saturated, a physician should be responsible for evaluating and monitoring the area where chromic acid made contact with the skin.

**You must:**

- (3) Provide lockers or other storage space to prevent contamination of street clothes.

**Reference:** You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See Per-

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11050, filed 7/17/02, effective 10/1/02.]

**You must:**

- (3) Provide lockers or other storage space to prevent contamination of street clothes.

**Reference:** You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See Per-

sonal protective equipment (PPE), WAC 296-800-160, in the safety and health core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-11050, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-120 Additional requirements for dip tanks using flammable or combustible liquids. Summary.**

**IMPORTANT:**

This section applies to:

- Flammable and combustible liquids (flashpoint below 200°F)
- Liquids that have a flashpoint of 200°F (93.3°C) or higher if you:
  - Heat the liquid
  - Dip a heated object in the tank

**Reference:** Store flammable and combustible liquids as required by Flammable and combustible liquids, WAC 296-24-330, in the general safety and health standards.

**Your responsibility:**

Safeguard employees working with dip tanks containing flammable or combustible liquids

**You must:**

**CONSTRUCTION**

Include additional safeguards when constructing dip tanks

WAC 296-835-12005

Provide overflow pipes

WAC 296-835-12010

Provide bottom drains

WAC 296-835-12015

**FIRE PROTECTION**

Provide fire protection in the vapor area

WAC 296-835-12020

Provide additional fire protection for large dip tanks

WAC 296-835-12025

**ELECTRICAL WIRING AND EQUIPMENT AND SOURCES**

**OF IGNITION**

Prevent static electricity sparks or arcs when adding liquids to a dip tank

WAC 296-835-12035

Control ignition sources in the vapor area and adjacent area

WAC 296-835-12040

Provide safe wiring and electrical equipment where the liquid can drip or splash

WAC 296-835-12045

**HOUSEKEEPING**

Keep the area around dip tanks clear of combustible material and properly dispose of waste

WAC 296-835-12050

**HEATING LIQUID**

Make sure heating the liquid in your dip tanks does not cause a fire

WAC 296-835-12055

**HEAT DRYING**

Make sure a heating system used for drying objects does not cause a fire

WAC 296-835-12060

**CONVEYORS**

Make sure the conveyor system for dip tanks is safe

WAC 296-835-12065.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-120, filed 7/17/02, effective 10/1/02.]

**CONSTRUCTION**

**WAC 296-835-12005 Include additional safeguards when constructing dip tanks.**

**You must:**

- (1) Make sure the dip tank, drain boards (if provided), and supports, are made of noncombustible material.
- (2) Make sure piping connections on drains and overflow pipes allow easy access to the inside of the pipe for inspection and cleaning.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12005, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-12010 Provide overflow pipes.**

**You must:**

- Provide an overflow pipe on dip tanks that:
  - Hold more than one hundred fifty gallons of liquid
- OR**
- Have more than ten square feet of liquid surface area
- Make sure the overflow pipe is:
  - Properly trapped
  - Able to prevent the dip tank from overflowing
  - Three inches or more (7.6 cm) in diameter
  - Discharged to a safe location.

**Note:** Discharged to a safe location could be a:
 

- Safe location outside the building

**OR**

- Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

**You must:**

- Make sure the bottom of the overflow pipe is at least six inches (15.2 cm) below the top of the tank.

**Note:** The overflow pipe should be large enough to remove water applied to the liquid surface of the dip tank from automatic sprinklers or other sources in the event of fire. Smaller dip tanks should be equipped with overflow pipes, if practical.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12010, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-12015 Provide bottom drains.**

**Exemption:** A bottom drain is not required if:

- The viscosity of the liquid makes it impractical to empty the tank by gravity or pumping

**OR**

– The dip tank has an automatic closing cover that meets the requirements of WAC 296-835-12030.

**You must:**

- Provide a bottom drain on all dip tanks that hold more than five hundred gallons of liquid.
- Make sure the bottom drain:
  - Is properly trapped
  - Will empty the dip tank during a fire
  - Has pipes large enough to empty the tank within five minutes
  - Uses automatic pumps if gravity draining is not practical
  - Is capable of both manual and automatic operation
  - Discharges to a safe location.

- Note:** Discharges to a safe location could be a:
- Safe location outside the building
- OR**
- Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

**You must:**

- Make sure manual operation of the bottom drain is performed from a safe and easily accessible location.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12015, filed 7/17/02, effective 10/1/02.]

**FIRE PROTECTION**

**WAC 296-835-12020 Provide fire protection in the vapor area.**

**You must:**

- Provide a manual fire extinguisher near the tank that is suitable for putting out flammable and combustible liquid fires.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12020, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-12025 Provide additional fire protection for large dip tanks.**

**You must:**

- Provide at least one automatic fire extinguishing system or an automatic dip tank cover if the tank:
    - Holds one hundred fifty gallons or more of liquid
- OR**
- Has four square feet or more of liquid surface area.
  - Make sure automatic fire extinguishing systems or automatic dip tank covers meet the requirements of Table 1.

**Exemption:** An automatic fire extinguishing system or an automatic dip tank cover is **not** required for a hardening or tempering tank that:

- Holds less than five hundred gallons

**OR**

- Has less than twenty-five square feet of liquid surface area.

**Table 1: Automatic Fire Protection System Requirements**

IF YOU PROVIDE:	THEN YOU MUST:
An automatic fire extinguishing system	<ul style="list-style-type: none"> <li>• Use extinguishing materials suitable for a fire fueled by the liquid in the tank</li> <li>• Make sure the system protects the:                             <ul style="list-style-type: none"> <li>- Tanks</li> <li>- Drain boards</li> <li>- Stock over drain boards.</li> </ul> </li> </ul>
A dip tank cover	<ul style="list-style-type: none"> <li>• Make sure the cover is:                             <ul style="list-style-type: none"> <li>- Closed by approved automatic devices in the event of fire</li> <li>- Able to be manually activated</li> <li>- Kept closed when the tank is not being used</li> <li>- Made of noncombustible material or metal-clad material with locked metal joints.</li> </ul> </li> </ul>

**Reference:** Automatic fire extinguishing systems have specific requirements. See:

- WAC 296-24-622 for automatic dry chemical extinguishing system requirements
- WAC 296-24-623 for automatic carbon dioxide extinguishing system requirements
- WAC 296-24-627 for automatic water spray extinguishing system and automatic foam extinguishing system requirements.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12025, filed 7/17/02, effective 10/1/02.]

**ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION**

**WAC 296-835-12035 Prevent static electricity sparks or arcs when adding liquids to a dip tank.**

**You must:**

- Make sure any portable container used to add liquid to the tank is:
  - Electrically bonded to the dip tank
  - Positively grounded.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12035, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-12040 Control ignition sources.**

**You must:**

- (1) Make sure the vapor areas and adjacent areas do not have any:
  - Open flames.
  - Spark producing devices.
  - Heated surfaces hot enough to ignite vapors.
- (2) Use explosion-proof wiring and equipment in the vapor area.

**Reference:** Electrical wiring and equipment has to meet the requirements of the applicable hazardous (classified) location. See Hazardous (classified) locations, WAC 296-24-95613. Electrostatic equipment has specific electrical requirements. See WAC 296-835-13010.

**You must:**

- (3) Prohibit smoking in any vapor area:
  - Post an easily seen "NO SMOKING" sign near each dip tank.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12040, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-12045 Provide safe electrical wiring and equipment where the liquid can drip or splash.**

**You must:**

- Make sure all electrical wiring and equipment in the vapor area is approved for areas that have:
  - Deposits of easily ignited residue
  - Explosive vapor

**Exemption:** This does not apply to wiring that is:

- In rigid conduit, threaded boxes or fittings
- Has no taps, splices, or terminal connections.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12045, filed 7/17/02, effective 10/1/02.]

**HOUSEKEEPING**

**WAC 296-835-12050 Keep the area around dip tanks clear of combustible material and properly dispose of waste.**

**You must:**

- (1) Make sure the area surrounding dip tanks is:
  - Completely free of combustible debris
  - As free of combustible stock as possible.
- (2) Provide approved metal waste cans that are:
  - Used for immediate disposal of rags and other material contaminated with liquids from dipping or coating operations
  - Emptied and the contents properly disposed of at the end of each shift.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12050, filed 7/17/02, effective 10/1/02.]

**HEATING LIQUID**

**WAC 296-835-12055 Make sure heating the liquid in your dip tanks does not cause a fire.**

**You must:**

- Keep the temperature of the liquid in the dip tank:
  - Below the liquid's boiling point
  - At least 100°F below the liquid's autoignition temperature.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12055, filed 7/17/02, effective 10/1/02.]

**HEAT DRYING**

**WAC 296-835-12060 Make sure a heating system used for drying objects does not cause a fire.**

**You must:**

- Make sure the heating system used in a drying operation that could cause ignition:
  - Has adequate mechanical ventilation that operates before and during the drying operation
  - Shuts down automatically if a ventilating fan fails to maintain adequate ventilation
  - Is installed as required by NFPA 86-1999, Standard for Ovens and Furnaces.

**Note:** Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12060, filed 7/17/02, effective 10/1/02.]

**CONVEYORS**

**WAC 296-835-12065 Make sure conveyor systems are safe.**

**You must:**

- Make sure the conveyor system shuts down automatically if:
  - The ventilation system fails to maintain adequate ventilation
- OR**
- There is a fire.

[Title 296 WAC—p. 2916]

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-12065, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-130 Additional requirements for dip tanks used for specific processes. Summary.**

**Your responsibility:** Safeguard employees working with dip tanks used for specific processes

**You must:****HARDENING OR TEMPERING**

Meet specific requirements if you use a hardening or tempering tank

WAC 296-835-13005

**ELECTROSTATIC EQUIPMENT**

Meet specific requirements if you use electrostatic equipment

WAC 296-835-13010

**FLOW COATING**

Meet specific requirements if you use flow coating

WAC 296-835-13015

**ROLL COATING**

Take additional precautions if your roll coating operation uses a liquid that has a flashpoint below 140°F (60°C)

WAC 296-835-13020

**VAPOR DEGREASING**

Provide additional safeguards for vapor degreasing tanks

WAC 296-835-13025

**SPRAY CLEANING OR DEGREASING**

Control liquid spray over an open surface cleaning or degreasing tank

WAC 296-835-13030.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-130, filed 7/17/02, effective 10/1/02.]

**HARDENING OR TEMPERING**

**WAC 296-835-13005 Meet specific requirements if you use a hardening or tempering tank.**

**You must:**

(1) Provide an automatic fire extinguishing system or an automatic dip tank cover for any hardening and tempering tank that uses flammable or combustible liquids and:

- Holds five hundred gallons (1893 L) or more of liquid

**OR**

- Has twenty-five square feet (2.37 m<sup>2</sup>) or more of liquid surface area.

(2) Prevent fires.

- Make sure hardening and tempering tanks are:

- **Not** located on or near combustible flooring.

- Located as far away as practical from furnaces.

- Equipped with noncombustible hoods and vents (or equally effective devices) for venting to the outside.

- Treat vent ducts as flues and keep them away from combustible material, particularly roofs.

(3) Make sure air under pressure is not used to:

- Fill the tank

**OR**

- Agitate the liquid in the tank.

(4) Equip each tank with an alarm that will sound when the temperature is within 50°F (10°C) of the liquid's flashpoint (alarm set point).

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(5) Make sure a limit switch shuts down conveyors supplying work to the tank when the temperature reaches the alarm setpoint, if operationally practical.

(6) Have a circulating cooling system if the temperature of the liquid can exceed the alarm set point.

**Note:** The bottom drain of the tank may be combined with the oil circulating system if the requirements for bottom drains in WAC 296-835-12015 are satisfied.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-13005, filed 7/17/02, effective 10/1/02.]

## ELECTROSTATIC EQUIPMENT

**WAC 296-835-13010 Meet specific requirements if you use electrostatic equipment.**

### ELECTRICAL

#### You must:

(1) Provide safe electrical equipment.

• Make sure electrodes in your equipment are:

- Substantial
- Rigidly supported
- Permanently located
- Effectively insulated from ground by insulators

• Make sure the insulators are:

- Nonporous
- Noncombustible
- Kept clean and dry

• Make sure high voltage leads to electrodes are effectively:

- Supported on permanent, suitable insulators
- Guarded against accidental contact or grounding.

(2) Make sure transformers, powerpacks, control apparatus, and all other electrical parts of the equipment:

- Are located outside the vapor area

#### OR

- Meet the requirements of WAC 296-835-12040.

**Exemption:** High voltage grids and their connections may be located in the vapor area without meeting the requirements of WAC 296-835-12040.

### PAINT DETEARING

#### You must:

(3) Safeguard paint detearing operations.

• Use approved electrostatic equipment in paint detearing operations.

(4) Make sure goods being paint deteared are:

- Supported on conveyors
- **Not** manually handled.

(5) Keep a minimum safe distance (twice the sparking distance) between goods being paint deteared and the electrodes or conductors of the electrostatic equipment at all times by:

- Arranging the conveyors to provide the necessary distance
- Supporting the goods to prevent swinging or movement, if necessary

• Post a sign that shows the minimum safe distance (twice the sparking distance) near the equipment, where it can be easily seen.

(6) Keep paint detearing operations separate from storage areas and people by using fences, rails or guards that are:

- Made of conducting material

– Adequately grounded.

(7) Protect paint detearing operations from fire by installing:

- Automatic sprinklers

#### OR

– An approved automatic fire extinguishing system.

(8) Collect and remove paint deposits by:

- Providing removable drip plates and screens
- Cleaning these plates and screens in a safe location.

### AUTOMATIC DISCONNECT REQUIREMENT

#### You must:

(9) Make sure electrostatic equipment has automatic controls that immediately disconnect the power supply to the high-voltage transformer and signal the operator, if:

• Ventilating fans or equipment stop or fail for any reason

• Conveyors do not work properly

• A ground (or imminent ground) occurs anywhere in the high-voltage system

#### OR

• Goods being paint deteared come within twice the sparking distance of the electrodes or conductors of the equipment.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-13010, filed 7/17/02, effective 10/1/02.]

## FLOW COATING

**WAC 296-835-13015 Meet specific requirements if you use a flow coating process.**

#### You must:

(1) Make sure all piping is substantial and rigidly supported.

(2) Make sure the paint is supplied by a:

• Gravity tank that does not hold more than ten gallons (38 L)

#### OR

• Direct low-pressure pumping system.

(3) Have an approved heat-actuated device that shuts down the pumping system if there is a fire.

**Note:** The area of the sump, and any areas on which paint flows, should be included in the area of dip tank.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-13015, filed 7/17/02, effective 10/1/02.]

## ROLL COATING

**WAC 296-835-13020 Take additional precautions if your roll coating operation uses a liquid that has a flashpoint below 140°F (60°C).**

#### IMPORTANT:

This section applies to the processes of roll coating, roll spreading, or roll impregnating that use a liquid having a flashpoint below 140°F (60°C). Material may be passed directly through a tank or over the surface of a roller that revolves partially submerged in the liquid.

#### You must:

• Prevent sparks from static electricity by:

– Bonding and grounding all metallic parts (including rotating parts) and installing static collectors

#### OR

– Maintaining a conductive atmosphere (one with a high relative humidity, for example) in the vapor area.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-13020, filed 7/17/02, effective 10/1/02.]

### VAPOR DEGREASING

**WAC 296-835-13025 Provide additional safeguards for vapor degreasing tanks.**

**You must:**

(1) Make sure, if the tank has a condenser or a vapor-level thermostat, that it keeps the vapor level at least:

- Thirty-six inches (91 cm) below the top of the tank if the width of the tank is seventy-two inches or more

**OR**

- One-half the tank width below the top of the tank if the tank is less than seventy-two inches wide.

(2) Make sure, if you use gas as a fuel to heat the tank liquid, that the combustion chamber is airtight (except for the flue opening) to prevent solvent vapors from entering the air-fuel mixture.

(3) Make sure the exhaust flue:

- Is made of corrosion-resistant material
- Extends to the outside
- Has a draft diverter if mechanical exhaust is used.

(4) Take special precautions to keep solvent vapors from mixing with the combustion air of the heater if chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene or freon) are used in the dip tank.

(5) Keep the temperature of the heating element low enough to keep a solvent or mixture from:

- Decomposing

**OR**

- Generating excessive vapor.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-13025, filed 7/17/02, effective 10/1/02.]

### SPRAY CLEANING OR DEGREASING

**WAC 296-835-13030 Control liquid spray over an open surface cleaning or degreasing tank.**

**You must:**

- Control the spray to the greatest extent feasible by:
  - Enclosing the spraying operation as completely as possible
  - Using mechanical ventilation to provide enough inward air velocity to prevent the spray from leaving the vapor area.

**Note:** Mechanical baffles may be used to help prevent the discharge of spray.

**Reference:** Spray painting operations are covered in Spray finishing using flammable and combustible materials, WAC 296-24-370, and Spray-finishing operations, WAC 296-62-11019.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-13030, filed 7/17/02, effective 10/1/02.]

**WAC 296-835-140 Definitions. ACGIH:** American Conference of Governmental Industrial Hygienists.

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**Adjacent area:** Any area within twenty feet (6.1 m) of a vapor area that is not separated from the vapor area by tight partitions.

**ANSI:** American National Standards Institute.

**Approved:** Approved or listed by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7, for definition of nationally recognized testing laboratory.

**Autoignition temperature:** The minimum temperature required to cause self-sustained combustion without any other source of heat.

**Combustible liquid:** A liquid having a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). Mixtures with at least ninety-nine percent of their components having flashpoints of 200°F (93.3°C) or higher are not considered combustible liquids.

**Detearing:** A process for removing excess wet coating material from the bottom edge of a dipped or coated object or material by passing it through an electrostatic field.

**Dip tank:** A container holding a liquid other than plain water that is used for dipping or coating. An object may be immersed (or partially immersed) in a dip tank or it may be suspended in a vapor coming from the tank.

**Flammable liquid:** Any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture.

**Flashpoint:** The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested by any of the measurement methods described in the definition of flashpoint in the safety and health core rules, WAC 296-800-370.

**Lower flammable limit:** The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent by volume of the material in air (or other oxidant).

**NFPA:** National Fire Protection Association.

**Vapor area:** Any area in the vicinity of dip tanks, their drain boards or associated drying, conveying, or other equipment where the vapor concentration could exceed twenty-five percent of the lower flammable limit (LFL) for the liquid in the tank.

**You:** Means the employer. See the definition of employer in the safety and health core rules, WAC 296-800-370.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-15-102, § 296-835-140, filed 7/17/02, effective 10/1/02.]

### Chapter 296-839 WAC

#### CONTENT AND DISTRIBUTION OF MATERIAL SAFETY DATA SHEETS (MSDSs) AND LABEL INFORMATION

**WAC**

296-839-100	Scope.
296-839-200	Hazard evaluation.
296-839-20005	Conduct complete hazard evaluations.
296-839-20010	Provide access to hazard evaluation procedures.
296-839-300	Material safety data sheets.
296-839-30005	Develop or obtain material safety data sheets (MSDSs).
296-839-30010	Provide MSDSs for products shipped, transferred or sold over-the-counter.

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- 296-839-30015 Follow-up if an MSDS is not provided.
- 296-839-400 Labeling.
- 296-839-40005 Label containers of hazardous chemicals.
- 296-839-500 Definitions.

**WAC 296-839-100 Scope.** This chapter sets minimum requirements for content and distribution of material safety data sheets (MSDSs) and labels for hazardous chemicals.

• This chapter applies when you do **one or more** of the following:

- Import, produce, or repackage chemicals, including manufactured items (such as bricks, welding rods, and sheet metal) that are not exempt as articles
- Sell or distribute hazardous chemicals to manufacturers, distributors or employers
- Choose to develop material safety data sheets (MSDSs) for a product you do not import or manufacture.

**Reference:**

See WAC 296-800-170, the Employer chemical hazard communication rule, for MSDSs, label, and other requirements that apply when hazardous chemicals are used in your workplace.

**Note:** • Use Table 2 to determine which sections in this chapter apply to your workplace.

**Exemptions:**

- All of the following are **always** exempt from this chapter:
  - Ionizing and nonionizing radiation
  - Biological hazards
  - Tobacco and tobacco products
- The chemicals and items listed in Table 1 are exempt from this chapter **under the conditions specified.**

<b>Table 1 Conditional Exemptions from this Chapter</b>	
<b>This chapter does NOT apply to</b>	<b>When</b>
<ul style="list-style-type: none"> <li>• Alcoholic beverages</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Foods</li> </ul>	<ul style="list-style-type: none"> <li>• Sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, bar, or tavern)</li> </ul>
<ul style="list-style-type: none"> <li>• An article (manufactured item)</li> </ul>	<ul style="list-style-type: none"> <li>• It is not a fluid or particle</li> <li><b>AND</b></li> <li>• It is formed to a specific shape or design during manufacture for a particular end use function<sup>1</sup></li> <li><b>AND</b></li> <li>• It releases only trace amounts of a hazardous chemical during normal use <b>AND</b> does not pose a physical or health risk to employees</li> </ul>
<ul style="list-style-type: none"> <li>• Consumer products                             <ul style="list-style-type: none"> <li>– Produced or distributed for sale meeting the definition of "consumer products" in the Consumer Product Safety Act (see U.S. Code, Title 15, Chapter 47, section 2052<sup>2</sup>)</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Hazardous household products                             <ul style="list-style-type: none"> <li>– Meeting the definition of "hazardous substances" in the Federal Hazardous Substance Act (see U.S. Code, Title 15, Chapter 30, section 1261<sup>2</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Both criteria apply:                             <ul style="list-style-type: none"> <li>– They are used in the workplace for the same purpose as intended by the manufacturer or importer</li> <li>– The duration and frequency of an employee's exposure is no more than the range of exposures that consumers might reasonably experience</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Cosmetics</li> </ul>	<ul style="list-style-type: none"> <li>• Packaged and sold in retail establishments</li> </ul>

<b>Table 1 Conditional Exemptions from this Chapter</b>	
<b>This chapter does NOT apply to</b>	<b>When</b>
<ul style="list-style-type: none"> <li>• Drugs                             <ul style="list-style-type: none"> <li>– Meeting the definition for "drugs" in the Federal Food, Drug, and Cosmetic Act (see U.S. Code, Title 21, Chapter 9, Subchapter II, section 321<sup>2</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• In solid, final form (for example, tablets, or pills) for direct administration to the patient</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Packaged and sold in retail establishments (for example, over-the-counter drugs)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Intended for employee consumption while in the workplace (for example, first-aid supplies)</li> </ul>
<ul style="list-style-type: none"> <li>• Hazardous solid wastes                             <ul style="list-style-type: none"> <li>– Meeting the definition of "hazardous wastes" in the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (see U.S. Code, Title 42, Chapter 82, Subchapter I, section 6903<sup>2</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Subject to the United States Environmental Protection Agency (EPA) regulations<sup>3</sup></li> </ul>
<ul style="list-style-type: none"> <li>• Hazardous substances                             <ul style="list-style-type: none"> <li>– Released into the environment, meeting the definition of "hazardous substances" in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (see U.S. Code, Title 42, Chapter 103, Subchapter I, section 9601<sup>2</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• They are the focus of remedial or removal action being conducted under CERCLA in accordance with EPA regulations (Title 40 of the Code of Federal Regulations (CFR)<sup>3</sup>)</li> </ul>
<ul style="list-style-type: none"> <li>• Hazardous wastes                             <ul style="list-style-type: none"> <li>– Meeting the definition of "dangerous wastes" in the Hazardous Waste Management Act (see chapter 70.105 RCW<sup>4</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Subject to department of ecology regulations, chapter 173-303 WAC<sup>5</sup>, that address the accumulation, handling and management of hazardous waste, and describe all of the following:                             <ul style="list-style-type: none"> <li>– Safety</li> <li>– Labeling</li> <li>– Personnel training</li> <li>– And other related requirements</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Solid wood</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Wood products (for example, lumber, and paper)</li> </ul>	<ul style="list-style-type: none"> <li>• All of the following apply                             <ul style="list-style-type: none"> <li>– The material is not treated with hazardous chemicals</li> <li>– The only hazard is potential flammability or combustibility</li> <li>– The product is not expected to be processed (for example, by sanding or sawing)</li> </ul> </li> </ul>

<sup>1</sup>End use is dependent in whole, or in part, upon maintaining the item's original shape or design. If the item will be significantly altered from its original form, it can no longer be considered a manufactured item

<sup>2</sup>This federal act is included in the United States Code. See <http://www.access.gpo.gov/uscode/usmain.html>

<sup>3</sup>EPA regulations are included in the Code of Federal Regulations (CFR). See <http://www.epa.gov>

<sup>4</sup>This state act is included in the Revised Code of Washington (RCW). The RCW compiles all permanent laws of the state. See <http://www.leg.wa.gov/wsladm/default.htm>

<sup>5</sup>See <http://www.ecy.wa.gov>

Use Table 2 to find out which sections of this chapter apply to you. For example, if you import **AND** sell hazardous chemicals **ALL** sections apply. WAC 296-839-500 applies to all employers covered by the scope of this chapter.

TABLE 2 Section Application				
If you	Then the sections marked with an "X" apply			
	20005 - 20010	30005	30010 - 30015	40005
• Import or produce chemicals	X	X		
• Sell or distribute hazardous chemicals to – Manufacturers <b>OR</b> – Distributors <b>OR</b> – Employers (includes retail or wholesale transactions)			X	X
• Choose to develop MSDSs for a product you do not import or manufacture	X	X		

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-100, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-200 Hazard evaluation.**

**Your responsibility:**

To make sure the hazardous chemicals are identified.

**You must:**

Conduct complete hazard evaluations

WAC 296-839-20005

Provide access to hazard evaluation procedures

WAC 296-839-20010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-200, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-20005 Conduct complete hazard evaluations. Important:**

• Hazard evaluation is a process where hazards of chemicals are identified by reviewing available research or testing information. You are not required to perform your own laboratory research or testing to meet the requirements of this section

– Information from hazard evaluations is used to complete material safety data sheets (MSDSs) and labels

– MSDSs from your suppliers may be used to complete the hazard evaluation for chemicals you produce

– MSDSs and labels are **NOT** required for chemicals that are determined to be nonhazardous

• Importers and manufacturers are required to develop MSDSs. If you choose to develop MSDSs for a product you do not import or manufacture, then this chapter also applies to you.

**You must:**

(1) Describe in writing your procedures for conducting hazard evaluations.

(2) Conduct a complete hazard evaluation for **ALL** chemicals you produce or import to determine if they are hazardous chemicals.

• Identify and consider available scientific evidence of health and physical hazards

• Evidence that meets the criteria in Table 3 must be used to establish a hazard

• Chemicals identified in a Table 4 source must be regarded as hazardous

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• The scope of health hazards considered must include the categories in Tables 5 and 6

• If the chemical is a mixture, follow the additional criteria in Table 7.

If you find evidence that meets the criteria in Table 3, use it in your hazard evaluation.

Table 3 Criteria for Hazard Evidence	
Hazard	Criteria
• Health hazard	<ul style="list-style-type: none"> <li>• Where available, use human case reports of health effects</li> <li><b>AND</b></li> <li>• One or more studies that                             <ul style="list-style-type: none"> <li>– Are based on human populations, if available, and animal populations<sup>1,2</sup></li> </ul> </li> <li><b>AND</b></li> <li>– Report statistically significant conclusions of a hazardous effect or health hazard (as defined in this rule)</li> <li><b>AND</b></li> <li>– Have been conducted following established scientific principles</li> </ul>
• Physical hazard	<ul style="list-style-type: none"> <li>• Valid evidence that shows a chemical is any one of the following<sup>3</sup>:                             <ul style="list-style-type: none"> <li>– A combustible liquid</li> <li>– A compressed gas</li> <li>– Explosive</li> <li>– Flammable</li> <li>– An organic peroxide</li> <li>– An oxidizer</li> <li>– Pyrophoric</li> <li>– Unstable (reactive)</li> <li>– Water-reactive</li> </ul> </li> </ul>

<sup>1</sup> If human data is not available, use results of tests done on animals and other available studies to predict health effects on employees (for example, effects resulting from short and long-term exposures to chemicals).

<sup>2</sup> In vitro studies alone do not generally form the basis of a finding of hazard.

<sup>3</sup>These terms are defined in WAC 296-839-500.

Chemicals identified in the sources listed in Table 4 must be assumed to be hazardous (including carcinogens and potential carcinogens).

Table 4 Information Sources Identifying Hazardous Chemicals	
<ul style="list-style-type: none"> <li>• Sources that address a broad range of hazard categories:                             <ul style="list-style-type: none"> <li>– Chapter 296-62 WAC, General Occupational Health Standards, WISHA</li> <li>– 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA)</li> <li>– <i>Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment</i>, American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition).</li> </ul> </li> <li>• Sources that identify carcinogens or potential carcinogens:                             <ul style="list-style-type: none"> <li>– Chapter 296-62 WAC, General Occupational Health Standards, WISHA</li> <li>– 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA)</li> <li>– National Toxicology Program (NTP), Annual Report on Carcinogens (latest edition)</li> <li>– International Agency for Research on Cancer (IARC) Monographs (latest editions).</li> </ul> </li> </ul>	
<p><b>Note:</b> The <i>Registry of Toxic Effects of Chemical Substances</i> is published by the National Institute for Occupational Safety and Health (NIOSH) and identifies chemicals found to be potential carcinogens by the NTP and IARC.</p>	

Chemicals meeting Table 5 definitions, along with the criteria for established evidence in Table 3, must be regarded as hazardous.

**Table 5 is NOT intended to present all hazard categories or test methods.** Available scientific data involving other test methods and animal species must also be evaluated to determine a chemical's hazards.

<b>A chemical is considered to be</b>	<b>If</b>
• A carcinogen	<ul style="list-style-type: none"> <li>• The International Agency for Research on Cancer (IARC) considers it to be a carcinogen or potential carcinogen</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• The National Toxicity Program (NTP) (latest edition) lists it as a carcinogen or potential carcinogen</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• It is regulated by WISHA or OSHA as a carcinogen</li> </ul>
• Corrosive	<ul style="list-style-type: none"> <li>• It causes visible destruction of, or irreversible alterations in, living tissue (not inanimate surfaces) by chemical action at the site of contact</li> </ul> Example: <ul style="list-style-type: none"> <li>– A chemical is corrosive if tested on the intact skin of albino rabbits by a method described by the U.S. Department of Transportation (in Appendix A to 49 CFR Part 173) and it destroys or changes (irreversibly) the structure of the tissue at the contact site after a four-hour exposure period</li> </ul>
• Toxic	<ul style="list-style-type: none"> <li>• It has a median lethal dose (LD50) greater than 50 milligrams per kilogram, but no more than 500 milligrams per kilogram of body weight, when administered orally to albino rats weighing between 200 - 300 grams each.</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• It has a median lethal dose (LD50) greater than 200 milligrams per kilogram, but not more than 1,000 milligrams per kilogram, of body weight when administered by continuous contact for twenty-four hours (or less if death occurs within twenty-four hours) with the bare skin of albino rabbits weighing between 2 - 3 kilograms each</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• It has a median lethal concentration (LC50), in air:               <ul style="list-style-type: none"> <li>– Greater than 200 parts per million, but not more than 2,000 parts per million (by volume of gas or vapor)</li> </ul> </li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>– Greater than 2 milligrams per liter, but not more than 20 milligrams per liter, of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats, weighing between 200 - 300 grams each</li> </ul>
• Highly toxic	<ul style="list-style-type: none"> <li>• It has a median lethal dose (LD50) of 50 milligrams, or less, per kilogram of body weight when administered orally to albino rats weighing between 200 - 300 grams each</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• It has a median lethal dose (LD50) of 200 milligrams, or less, per kilogram of body weight when administered by continuous contact for twenty-four hours (or less if death occurs within twenty-four hours) with the bare skin of albino rabbits weighing between 2 - 3 kilograms each</li> </ul>

<b>A chemical is considered to be</b>	<b>If</b>
	<b>OR</b> <ul style="list-style-type: none"> <li>• It has a median lethal concentration of (LC50), in air, of:               <ul style="list-style-type: none"> <li>– 200 parts per million (by volume), or less, of gas or vapor</li> </ul> </li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>– 2 milligrams per liter, or less, of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 - 300 grams each</li> </ul>
• An irritant	<ul style="list-style-type: none"> <li>• It is <b>NOT</b> corrosive, but causes a reversible inflammatory effect on living tissue by chemical action at the contact site</li> </ul> Examples: <ul style="list-style-type: none"> <li>– The chemical is a skin irritant when tested on the intact skin of albino rabbits (by the methods of 16 CFR 1500.41) for four hours exposure, (or by other appropriate techniques) and the exposure results in an empirical score of five or more</li> <li>– A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques</li> </ul>
• A sensitizer	<ul style="list-style-type: none"> <li>• It causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure</li> </ul>

Categories provided in Table 6 illustrate the broad range of target organ effects that must be considered when conducting hazard evaluations. Chemicals meeting Table 6 definitions, along with the criteria for established evidence in Table 3, must be regarded as hazardous.

Examples provided in Table 6 are **NOT** intended to be a complete list.

Category	Definition	Examples of Signs and Symptoms	Examples of Chemicals
Hepatotoxins	Cause liver damage	<ul style="list-style-type: none"> <li>• Jaundice</li> <li>• Liver enlargement</li> </ul>	<ul style="list-style-type: none"> <li>• Carbon tetrachloride</li> <li>• Nitrosamines</li> </ul>
Nephrotoxins	Cause kidney damage	<ul style="list-style-type: none"> <li>• Edema</li> <li>• Proteinuria</li> </ul>	<ul style="list-style-type: none"> <li>• Halogenated hydrocarbons</li> <li>• Cadmium</li> </ul>
Neurotoxins	Cause primary toxic effects on the nervous system	<ul style="list-style-type: none"> <li>• Narcosis</li> <li>• Behavioral changes</li> <li>• Decrease in motor functions</li> </ul>	<ul style="list-style-type: none"> <li>• Mercury</li> <li>• Carbon disulfide</li> <li>• Lead</li> </ul>
Chemicals that act on the <ul style="list-style-type: none"> <li>• Blood</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Hematopoietic (blood forming) system</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease hemoglobin function</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Deprive the body tissues of oxygen</li> </ul>	<ul style="list-style-type: none"> <li>• Cyanosis</li> <li>• Loss of consciousness</li> </ul>	<ul style="list-style-type: none"> <li>• Carbon monoxide</li> <li>• Cyanides</li> <li>• Benzene</li> </ul>
Chemicals that damage the lungs	<ul style="list-style-type: none"> <li>• Irritate lungs</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Damage pulmonary tissue</li> </ul>	<ul style="list-style-type: none"> <li>• Cough</li> <li>• Tightness in chest</li> <li>• Shortness of breath</li> </ul>	<ul style="list-style-type: none"> <li>• Silica</li> <li>• Asbestos</li> </ul>
Reproductive toxins	Affect reproductive capabilities, including: <ul style="list-style-type: none"> <li>• Chromosomal damage (mutation)</li> <li>• Effects on fetuses (teratogenesis)</li> </ul>	<ul style="list-style-type: none"> <li>• Birth defects</li> <li>• Sterility</li> </ul>	<ul style="list-style-type: none"> <li>• Lead</li> <li>• 1,2-Dibromo-3-chloropropane (DBCP)</li> <li>• Nitrous Oxide</li> </ul>
Cutaneous (skin) hazards	Affect the dermal layer of the body	<ul style="list-style-type: none"> <li>• Defatting of the skin</li> <li>• Rashes</li> <li>• Irritation</li> </ul>	<ul style="list-style-type: none"> <li>• Ketones</li> <li>• Chlorinated compounds</li> </ul>
Eye hazards	Affect the eye or ability to see	<ul style="list-style-type: none"> <li>• Conjunctivitis</li> <li>• Corneal damage</li> </ul>	<ul style="list-style-type: none"> <li>• Organic solvents</li> <li>• Acids</li> </ul>

If a mixture	Then
<ul style="list-style-type: none"> <li>• Has been thoroughly tested as a whole for a physical or health hazard</li> </ul>	<ul style="list-style-type: none"> <li>• You must use those results</li> </ul>
<ul style="list-style-type: none"> <li>• Has NOT been tested as a whole for a health hazard</li> </ul>	<ul style="list-style-type: none"> <li>• You must: <ul style="list-style-type: none"> <li>– Evaluate EACH ingredient in the mixture to determine the hazards</li> <li>– Consider the mixture to have the same hazard as each ingredient determined to be hazardous</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Has NOT been tested as a whole for physical hazards</li> </ul>	<ul style="list-style-type: none"> <li>• You must: <ul style="list-style-type: none"> <li>• Use any scientifically valid data available to evaluate the potential physical hazards of the mixture</li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-20005, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-20010 Provide access to hazard evaluation procedures.**

**You must:**

- Provide access to your written hazard evaluation procedures when requested by any of the following:
  - Employees
  - Designated representatives of employees
  - Representatives of the department of labor and industries
  - Representatives of the National Institute for Occupational Safety and Health (NIOSH).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-20010, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-300 Material safety data sheets.**

**Your responsibility:**

To provide complete and accurate material safety data sheets (MSDSs).

**You must:**

Develop or obtain MSDSs  
WAC 296-839-30005

Provide MSDSs

WAC 296-839-30010

Follow-up if an MSDS is not provided

WAC 296-839-30015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-300, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-30005 Develop or obtain material safety data sheets (MSDSs).**

**You must:**

- Develop or obtain a complete and accurate material safety data sheet (MSDS) for each hazardous chemical or mixture according to ALL of the following:

– ALL information in Table 8 must be completed. If there is no relevant information for a required item, this must be noted. Blank spaces are not permitted.

- Note:**
- No specific format is required for MSDSs; however, an example format (OSHA form 174) can be found online at: <http://www.osha.gov>
  - One MSDS can be developed for a group of complex mixtures (for example, jet fuels or crude oil) IF the health and physical hazards of the mixtures are similar (the amounts of chemicals in the mixture may vary).

– Content of MSDSs must accurately represent the available scientific evidence.

- Note:** You may report results of scientifically valid studies that tend to refute findings of hazards.

– MSDSs must be in English.

- Note:** You may develop copies of MSDSs in other languages.

**You must:**

- Revise an MSDS when you become aware of new and significant information regarding the hazards of a chemical, or how to protect against the hazards

– Within three months after you first become aware of the information

**OR**

– Before the chemical is reintroduced into the workplace if the chemical is no longer being used, produced or imported.

<b>Table 8 Information Required on MSDSs</b>
• The chemical's identity as it appears on the label
• The date the MSDS was prepared or updated
• A contact for additional information about the hazardous chemical and appropriate emergency procedures Include all of the following: <ul style="list-style-type: none"> <li>– Name</li> <li>– Address</li> <li>– Telephone number of the responsible party preparing or distributing the MSDS</li> </ul>
• The chemical's hazardous ingredients <sup>1</sup> as determined by your hazard evaluation <ul style="list-style-type: none"> <li>– For a <b>single substance chemical</b>, include the chemical and common name(s) of the substance</li> <li>– For <b>mixtures</b> tested as a whole <ul style="list-style-type: none"> <li>■ Include the common name(s) of the mixture</li> </ul> </li> <li style="text-align: center;">AND</li> <li>■ List the chemical and common name(s) of ingredients that contribute to the known hazards</li> <li>– For <b>mixtures NOT</b> tested as a whole, list the chemical and common name(s) of hazardous ingredients <ul style="list-style-type: none"> <li>■ That make up 1% or more of the mixture, by weight or volume, including carcinogens (if 0.1% concentration or more, by weight or volume)</li> <li>– If ingredients are less than the above concentrations but may present a health risk to employees (for example, allergic reaction or exposure could exceed the permissible exposure limits, or PEL) they must be listed here</li> </ul> </li> </ul>
• Exposure limits for airborne concentrations. Include ALL of the following, when they exist: <ul style="list-style-type: none"> <li>– WISHA or OSHA PELs<sup>2</sup> <ul style="list-style-type: none"> <li>■ The 8-hour time weighted average (TWA)</li> <li>■ The short-term exposure limit (STEL), if available</li> <li>■ Ceiling values, if available</li> </ul> </li> <li>– Threshold limit values (TLVs) including 8-hour TWAs, STELs, and ceiling values</li> <li>– Other exposure limits used or recommended by the employer preparing the MSDS</li> </ul>
• Physical and chemical characteristics <ul style="list-style-type: none"> <li>– For example, boiling point, vapor pressure, and odor</li> </ul>
• Fire, explosion data, and related information <ul style="list-style-type: none"> <li>– For example, flashpoint, flammable and explosion limits, extinguishing media, and unusual fire or explosion hazards</li> </ul>
• Physical hazards of the chemical including reactivity information <ul style="list-style-type: none"> <li>– For example, incompatibilities, decomposition products, by-products, and conditions to avoid</li> </ul>
• Health hazard information including ALL of the following: <ul style="list-style-type: none"> <li>– Primary routes of exposure <ul style="list-style-type: none"> <li>■ For example, inhalation, ingestion, and skin absorption or other contact<sup>3</sup></li> </ul> </li> <li>– Health effects (or hazards) associated with: <ul style="list-style-type: none"> <li>■ Short-term exposure<sup>4</sup></li> </ul> </li> <li style="text-align: center;">AND</li> <li>■ Long-term exposure<sup>4</sup></li> <li>– Whether the chemical is listed or described as a carcinogen or potential carcinogen in the latest editions of each of the following: <ul style="list-style-type: none"> <li>■ The National Toxicology Program (NTP) Annual Report on Carcinogens</li> </ul> </li> <li style="text-align: center;">OR</li> <li>■ The International Agency for Research on Cancer (IARC) Monographs as a potential carcinogen</li> <li style="text-align: center;">OR</li> <li>■ WISHA or OSHA rules</li> <li>– Signs and symptoms of exposure<sup>5</sup></li> <li>– Medical conditions generally recognized as being aggravated by exposure</li> </ul>
• Emergency and first-aid procedures

<b>Table 8 Information Required on MSDSs</b>
• Generally applicable precautions for safe handling and use known to the employer preparing the MSDS <ul style="list-style-type: none"> <li>– For example, appropriate procedures for clean-up of spills and leaks, waste disposal method, precautions during handling and storing</li> </ul>
• Generally applicable and appropriate control measures known to the employer preparing the MSDS, including ALL of the following: <ul style="list-style-type: none"> <li>– Engineering controls (for example, general or local exhaust ventilation)</li> <li>– Work practices</li> <li>– Personal protective equipment (PPE)</li> <li>– Personal hygiene practices</li> <li>– Protective measures during repair and maintenance of contaminated equipment</li> </ul>

<sup>1</sup>The identities of some chemicals may be protected as trade secret information (see chapter 296-62 WAC, Part B-1, Trade secrets).

<sup>2</sup> WISHA PEL categories are defined, and values are provided, in chapter 296-841 WAC, identifying and controlling respiratory hazards.

<sup>3</sup> A "skin notation" listed with either an ACGIH TLV or WISHA/OSHA PEL indicates that skin absorption is a primary route of exposure.

<sup>4</sup>Examples of:

- Short-term health effects (or hazards) include eye irritation, skin damage caused by contact with corrosives, narcosis, sensitization, and lethal dose.

- Long-term health effects (or hazards) include cancer, liver degeneration, and silicosis.

<sup>5</sup>Signs and symptoms of exposure to hazardous substances include those that:

- Can be measured such as decreased pulmonary function

AND

- Are subjective such as feeling short of breath.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-839-30005, filed 1/18/05, effective 3/1/05; 03-01-096, § 296-839-30005, filed 12/17/02, effective 6/1/03.]

### **WAC 296-839-30010 Provide MSDSs for products shipped, transferred or sold over-the-counter.**

#### **You must:**

- Provide the correct MSDS to manufacturers, distributors and employers:

- With the initial shipment or transfer of the product

AND

- With the first shipment or transfer after an MSDS is updated

AND

- Whenever one is requested.

**Note:** • MSDSs may be provided separately from containers as long as they are provided before or at the same time as the containers. For example, you may fax, or e-mail the MSDS.

- You are NOT required to provide MSDSs to retailers who inform you they

- Do not sell the product to commercial accounts

AND

- Do not open the sealed product containers for use in their workplace.

#### **You must:**

- Follow the requirements in Table 9 for chemicals sold over-the-counter.

<b>Table 9 Requirements for Chemicals Sold Over-the-Counter (NOT Shipped)</b>	
<b>If you are a</b>	<b>Then</b>
• Retail distributor <b>WITH</b> commercial accounts	• Provide an MSDS to employers with commercial accounts when requested <b>AND</b> • Post a sign, or otherwise inform employers, that MSDSs are available
• Retail distributor <b>WITHOUT</b> commercial accounts	• Provide the employer, when requested, with <b>ALL</b> of the following: – Name – Address – Telephone number of the chemical manufacturer, importer, or distributor who can provide an MSDS
• Wholesale distributor selling products over-the-counter to employers	• Provide an MSDS to employers with commercial accounts when requested <b>AND</b> • Post a sign, or otherwise inform employers, that MSDSs are available

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-30010, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-30015 Follow-up if an MSDS is not provided.**

**You must:**

- Obtain an MSDS from the chemical manufacturer, distributor or importer as soon as possible, if an MSDS is not provided for a shipment labeled as a hazardous chemical.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-30015, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-400 Labeling.**

**Your responsibility:**

To provide employers with containers of hazardous chemicals that are properly labeled.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-01-096, § 296-839-400, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-40005 Label containers of hazardous chemicals.**

**Exemption:**

Containers are exempt from this section if **ALL** hazardous contents are listed in Table 11.

**You must:**

- Make sure every container of hazardous chemicals leaving the workplace is properly labeled. This includes **ALL** of the following:
  - The identity of the hazardous chemical (the chemical or common name) that matches the identity used on the MSDS
  - An appropriate hazard warning
  - The name and address of the chemical manufacturer, importer, or other responsible party
  - Make sure labeling does not conflict with the requirements of:
    - The Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.)

[Title 296 WAC—p. 2924]

**AND**

■ Regulations issued under the act by the U.S. Department of Transportation (Title 49 of the Code of Federal Regulations, Parts 171 through 180). See <http://www.dot.gov>

– Revise labels within three months of becoming aware of new and significant information about chemical hazards

– Provide revised labels on containers beginning with the first shipment after a revision, to manufacturers, distributors or employers

– Revise the label when a chemical is not currently used, produced or imported, before:

- You resume shipping (or transferring) the chemical

**OR**

- The chemical is reintroduced in the workplace

– Label information

- Clearly written in English

**AND**

- Prominently displayed on the container

**Note:** When the conditions specified in Table 10 are met for the solid material products listed you are not required to provide labels for every shipment.

<b>Table 10 Labeling for Solid Materials</b>	
<b>You need only send labels with the first shipment, IF the product is</b>	<b>And</b>
<b>Whole grain</b>	• It is shipped to the same customer <b>AND</b> • No hazardous chemicals are part of or known to be present with the product which could expose employees during handling – For example, cutting fluids on solid metal, and pesticides with grain
<b>Solid untreated wood</b>	
<b>Solid metal</b> For example: Steel beams, metal castings	
<b>Plastic items</b>	

**Exemptions:**

The chemicals (and items) listed in Table 11 are **EXEMPT** from **THIS SECTION** under the conditions specified. Requirements in other sections still apply.

<b>Table 11 Conditional Label Exemptions</b>	
<b>This section does not apply to</b>	<b>When the product is</b>
• Pesticides – Meeting the definition of "pesticides" in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (see Title 7, U.S.C. Chapter 6, Subchapter II, section 136 <sup>1</sup> )	• Subject to – Labeling requirements of FIFRA <sup>1</sup> <b>AND</b> – Labeling regulations issued under FIFRA by the United States Environmental Protection Agency (EPA) (see Title 40 of the Code of Federal Regulations <sup>2</sup> )

Table 11 Conditional Label Exemptions	
This section does not apply to	When the product is
<ul style="list-style-type: none"> <li>A chemical substance or mixture                             <ul style="list-style-type: none"> <li>Meeting the definition of "chemical substance" or "mixture" in the Toxic Substance Control Act (TSCA) (see Title 15 U.S.C. Chapter 53, Subchapter II, Section 2602<sup>1</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Subject to                             <ul style="list-style-type: none"> <li>Labeling requirements of TSCA<sup>1</sup></li> </ul> </li> <li>AND                             <ul style="list-style-type: none"> <li>Labeling requirements issued under TSCA by the EPA (see Title 40 of the Code of Federal Regulations<sup>2</sup>)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Each of the following:                             <ul style="list-style-type: none"> <li>Food</li> <li>Food additives</li> <li>Color additives</li> <li>Drugs</li> <li>Cosmetics</li> <li>Medical devices or products</li> <li>Veterinary devices or products</li> <li>Materials intended for use in these products (for example: Flavors, and fragrances)</li> </ul> </li> <li>As defined in                             <ul style="list-style-type: none"> <li>The Federal Food, Drug, and Cosmetic Act (see Title 21 U.S.C. Chapter 9, Subchapter II, Section 321<sup>1</sup>)</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>Or the Virus-Serum Toxin Act of 1913 (see Title 21 U.S.C. Chapter 5, Section 151 et seq.<sup>1</sup>)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>Regulations issued under these acts (see Title 21 Part 101 in the Code of Federal Regulations, and Title 9, in the Code of Federal Regulations<sup>3</sup>)</li> </ul>	<ul style="list-style-type: none"> <li>Subject to:                             <ul style="list-style-type: none"> <li>Labeling requirements in Federal Food, Drug, and Cosmetic Act, Virus-Serum Toxin Act of 1913, and issued regulations enforced by the United States                                     <ul style="list-style-type: none"> <li>Food and Drug Administration (see Title 21 Parts 101-180 in the Code of Federal Regulations<sup>3</sup>)</li> </ul> </li> </ul> </li> <li>OR                             <ul style="list-style-type: none"> <li>Department of Agriculture (see Title 9, in the Code of Federal Regulations<sup>3</sup>)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Each of the following:                             <ul style="list-style-type: none"> <li>Distilled spirits (beverage alcohols)</li> </ul> </li> <li>AND                             <ul style="list-style-type: none"> <li>Wine</li> </ul> </li> <li>AND                             <ul style="list-style-type: none"> <li>Malt beverage</li> </ul> </li> <li>As defined in                             <ul style="list-style-type: none"> <li>The Federal Alcohol Administration Act (see Title 27 U.S.C. Section 201<sup>1</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Subject to:                             <ul style="list-style-type: none"> <li>Labeling requirements of Federal Alcohol Administration Act<sup>1</sup></li> </ul> </li> <li>AND                             <ul style="list-style-type: none"> <li>Labeling regulations issued under Federal Alcohol Administration Act by the Bureau of Alcohol, Tobacco, and Firearms (see Title 27 in the Code of Federal Regulations<sup>3</sup>)</li> </ul> </li> </ul>

Table 11 Conditional Label Exemptions	
This section does not apply to	When the product is
<p><b>AND</b></p> <ul style="list-style-type: none"> <li>Regulations issued under this act (see Title 27 in the Code of Federal Regulations)<sup>3</sup></li> </ul>	
<ul style="list-style-type: none"> <li>Consumer products</li> <li>AND</li> <li>Hazardous substances                             <ul style="list-style-type: none"> <li>As defined in                                     <ul style="list-style-type: none"> <li>The Consumer Product Safety Act (see 15 U.S.C. 2051 et seq.<sup>1</sup>)</li> </ul> </li> </ul> </li> <li>AND                             <ul style="list-style-type: none"> <li>The Federal Hazardous Substances Act (see 15 U.S.C. 1261 et seq.<sup>1</sup>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Subject to:                             <ul style="list-style-type: none"> <li>A consumer product safety or labeling requirement of the Consumer Product Safety Act or Federal Hazardous Substances Act<sup>1</sup></li> </ul> </li> <li>OR                             <ul style="list-style-type: none"> <li>Regulations issued under these acts by the Consumer Product Safety Commission (see Title 16 in the Code of Federal Regulations<sup>3</sup>)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Agricultural seed</li> <li>AND</li> <li>Vegetable seed treated with pesticides</li> </ul>	<ul style="list-style-type: none"> <li>Labeled as required by                             <ul style="list-style-type: none"> <li>The Federal Seed Act (see Title 7 U.S.C. Chapter 37 Section 1551 et seq.<sup>1</sup>)</li> </ul> </li> <li>AND                             <ul style="list-style-type: none"> <li>Labeling requirements issued under Federal Seed Act by the United States Department of Agriculture<sup>1</sup></li> </ul> </li> </ul>

<sup>1</sup>This federal act is included in the United States Code. See <http://www.access.gpo.gov/uscode/usmain.html>

<sup>2</sup>See <http://www.epa.gov>

<sup>3</sup>See <http://www.access.gpo.gov/nara/cfr/index.html>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 49.17.080-087, § 296-839-40005, filed 4/4/06, effective 9/1/06; 03-01-096, § 296-839-40005, filed 12/17/02, effective 6/1/03.]

**WAC 296-839-500 Definitions.** The following definitions apply to this chapter:

Article (manufactured item)

A manufactured item that

- Is not a fluid or particle

**AND**

- Is formed to a specific shape or design during manufacture for a particular end use function

**AND**

- Releases only trace amounts of a hazardous chemical during normal use and does not pose a physical or health risk to employees.

Chemical

- An element or mixture of elements

**OR**

- A compound or mixture of compounds

**OR**

- A mixture of elements and compounds

Included are manufactured items (such as bricks, welding rods and sheet metal) that are not exempt as an article.

Chemical name

• The scientific designation of a chemical developed by the

– International union of pure and applied chemistry (IUPAC)

**OR**

– Chemical abstracts service (CAS) rules of nomenclature

**OR**

• A name that clearly identifies the chemical for the purpose of conducting a hazard evaluation.

Combustible liquid

Liquids with a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). A mixture with at least 99% of its components having flashpoints of 200°F (93.3°C), or higher, is not considered a combustible liquid.

Commercial account

An arrangement where a retailer is selling hazardous chemicals to an employer

• Generally in large quantities over time

**OR**

• At costs below regular retail price.

Common name

Any designation or identification used to identify a chemical other than the chemical name, such as a

• Code name or number

**OR**

• Trade or brand name

**OR**

• Generic name.

Compressed gas

• A contained gas or mixture of gases with an absolute pressure greater than:

– 40 psi at 70°F (21.1°C)

**OR**

– 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C)

**OR**

• A liquid with a vapor pressure greater than 40 psi at 100°F (37.8°C), as determined by ASTM D323-72.

Container

A vessel, other than a pipe or piping system, that holds a hazardous chemical. Examples include:

- Bags
- Barrels
- Bottles
- Boxes
- Cans
- Cylinders
- Drums
- Reaction vessels
- Storage tanks
- Rail cars.

Designated representative

• An individual or organization with written authorization from an employee

**OR**

• A recognized or certified collective bargaining agent (not necessarily authorized by an employee)

**OR**

• A legal representative of a deceased or legally incapacitated employee.

Distributor

A business that supplies hazardous chemicals to other employers. Included are employers who conduct retail and wholesale transactions.

Explosive

A chemical that causes a sudden, almost instant release of pressure, gas, and heat when exposed to a sudden shock, pressure, or high temperature.

Flammable

A chemical in one of the following categories:

• Aerosols that, when tested using a method described in 16 CFR 1500.45, yield either a:

– Flame projection of more than eighteen inches at full valve opening

**OR**

– A flashback (a flame extending back to the valve) at any degree of valve opening

• Gases that, at the temperature and pressure of the surrounding area, form a:

– Flammable mixture with air at a concentration of thirteen percent, by volume, or less

**OR**

– Range of flammable mixtures with air wider than twelve percent, by volume, regardless of the lower limit

• Liquids with a flashpoint below 100°F (37.8°C). A mixture with at least ninety-nine percent of its components having flashpoints of 100°F (37.8°C), or higher, is not considered a flammable liquid

• Solids, other than blasting agents or explosives, as defined in WAC 296-52-417 or 29 CFR 1910.109(a), that:

– Is likely to cause fire through friction, moisture, absorption, spontaneous chemical change or retained heat from manufacturing or processing

**OR**

– That can be readily ignited (and when ignited burns so vigorously and persistently that it creates a serious hazard)

**OR**

– When tested by the method described in 16 CFR 1500.44, ignite and burn with a self-sustained flame at a rate greater than 1/10th of an inch per second along its major axis.

Flashpoint

The minimum temperature at which a liquid gives off an ignitable concentration of vapor, when tested by any of the following measurement methods:

• Tagliabue closed tester. Use this for liquids with a viscosity less than, 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not tend to form a surface film under test. See American National Standard Method of Test for Flashpoint by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)

• Pensky-Martens closed tester. Use this for liquids with a viscosity equal to, or greater than, 45 SUS at 100°F (37.8°C) or for liquids that contain suspended solids or have a tendency to form a surface film under test. See American

National Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)

- Setaflash closed tester. See American National Standard Method of Test for Flashpoint by Setaflash Closed Tester (ASTM D 3278-78)

Organic peroxides, which undergo auto accelerating thermal decomposition, are excluded from any of the flashpoint measurement methods specified above.

Hazardous chemical

A chemical, which is a physical or health hazard.

Hazard warning

Words, pictures or symbols (alone or in combination) that appear on labels (or other forms of warning such as placards or tags) that communicate specific physical and health hazards (including target organ effects) associated with chemicals in a container.

Health hazard

A chemical that may cause health effects in short or long-term exposed employees based on statistically significant evidence from a single study conducted by using established scientific principles.

Health hazards include, but are not limited to, any of the following:

- Carcinogens
- Toxic or highly toxic substances
- Reproductive toxins
- Irritants
- Corrosives
- Sensitizers
- Hepatotoxins (liver toxins)
- Nephrotoxins (kidney toxins)
- Neurotoxins (nervous system toxins)
- Substances that act on the hematopoietic system (blood or blood forming system)
- Substances that can damage the lungs, skin, eyes, or mucous membranes.

Identity

A chemical or common name listed on the material safety data sheet (MSDS) and label.

Importer

The first business, within the Customs Territory of the United States, that receives hazardous chemicals produced in other countries and supplies them to manufacturers, distributors or employers within the United States.

Label

Written, printed, or graphic material displayed on, or attached to, a container of hazardous chemicals.

Manufacturer

An employer with a workplace where one or more chemicals (including items not exempt as "articles," see Table 1 in this chapter) are produced for use or distribution.

Material safety data sheet (MSDS)

Written, printed or electronic information (on paper, microfiche, or on-screen) that informs manufacturers, distributors or employers about the chemical, its hazards and protective measures as required by this rule.

Mixture

A combination of two or more chemicals that retain their chemical identity after being combined.

Organic peroxide

An organic compound containing the bivalent-O-O-structure. It may be considered a structural derivative of hydrogen peroxide if one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer

A chemical, other than a blasting agent or explosive as defined in WAC 296-52-417 or 29 CFR 1910.109(a), that starts or promotes combustion in other materials, causing fire either of itself or through the release of oxygen or other gases.

Permissible exposure limits

See chapter 296-841 WAC, for definition of this term.

Physical hazards

A chemical that has scientifically valid evidence to show it is one of the following:

- A combustible liquid
- A compressed gas
- Explosive
- Flammable
- An organic peroxide
- An oxidizer
- Pyrophoric
- Unstable (reactive)
- Water-reactive.

Produce

To do one or more of the following:

- Manufacture
- Process
- Formulate
- Blend
- Extract
- Generate
- Emit
- Repackage.

Pyrophoric

Chemicals that ignite spontaneously in the air at a temperature of 130°F (54.4°C) or below.

Responsible party

Someone who can provide more information about the hazardous chemical and appropriate emergency procedures.

Retailer

See "distributor."

Threshold limit values (TLVs)

Airborne concentrations of substances established by the American Conference of Governmental Industrial Hygienists (ACGIH), and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse health effects.

TLVs are specified in the most recent edition of the *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices* and include the following categories:

- Threshold limit value-time-weighted average (TLV-TWA)
- Threshold limit value-short-term exposure limit (TLV-STEL)
- Threshold limit value-ceiling (TLV-C).

Unstable (reactive)

A chemical in its pure state, or as produced or transported, that will vigorously polymerize, decompose, condense, or become self-reactive under conditions of shocks, pressure or temperature.

Use

To do one or more of the following:

- Package
- Handle
- React
- Emit
- Extract
- Generate as a by-product
- Transfer.

Water-reactive

A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

Wholesaler

See "distributor."

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-03-093, § 296-839-500, filed 1/18/05, effective 3/1/05; 03-01-096, § 296-839-500, filed 12/17/02, effective 6/1/03.]

### Chapter 296-841 WAC RESPIRATORY HAZARDS

#### WAC

296-841-100	Scope.
296-841-200	Evaluate and control employee exposures.
296-841-20005	Identify and evaluate respiratory hazards.
296-841-20010	Control employee exposures.
296-841-20015	Use respirators.
296-841-20020	Notify employees.
296-841-20025	Permissible exposure limits of air contaminants.
296-841-300	Definitions.

**WAC 296-841-100 Scope.** This chapter applies **only** if your employees:

- Are exposed to a respiratory hazard

**OR**

• Could be exposed to one of the specific hazards listed below.

This chapter applies to any workplace with potential or actual employee exposure to respiratory hazards. It requires you to protect employees from respiratory hazards by applying this protection strategy:

• Evaluate employee exposures to determine if controls are needed

• Use feasible controls. For example, enclose or confine the operation, use ventilation systems, or substitute with less toxic material

• Use respirators if controls are not feasible or if they cannot completely remove the hazard.

#### **Definition:**

#### **Exposed or exposure:**

The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

- Note:**
- Examples of substances that may be respiratory hazards when airborne include:
    - Chemicals listed in Table 3
    - Any substance
  - Listed in the latest edition of the NIOSH Registry of Toxic Effects of Chemical Substances
  - For which positive evidence of an acute or chronic health hazard exists through tests conducted by, or known to, the employer

• That may pose a hazard to human health as stated on a material safety data sheet kept by, or known to, the employer

– Atmospheres considered oxygen deficient

– Biological agents such as harmful bacteria, viruses or fungi

– Examples include airborne TB aerosols and anthrax

• Pesticides with a label requirement for respirator use

• Chemicals used as crowd control agents such as pepper spray

• Chemicals present at clandestine drug labs.

• These substances can be airborne as dusts, fibers, fogs, fumes, mists, gases, smoke, sprays, vapors, or aerosols.

• Substances in Table 3 that are marked with an X in the "skin" column may require personal protective equipment (PPE). See WAC 296-800-160, Personal protective equipment, for additional information and requirements.

• If any of the following hazards are present in your workplace, you will need both this chapter and any of the following specific rules that apply:

#### **Reference:**

#### **Hazard**

Acrylonitrile

Arsenic (inorganic)

Asbestos

Benzene

Butadiene

Cadmium

Carcinogens

Coke ovens

Cotton dust

1, 2-Dibromo-3-

chloropropane

Ethylene oxide

Formaldehyde

Lead

Methylene chloride

Methylenedianiline

Thiram

Vinyl chloride

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 06-08-087, § 296-841-100, filed 4/4/06, effective 9/1/06; 05-17-168, § 296-841-100, filed 8/23/05, effective 1/1/06; 04-18-079, § 296-841-100, filed 8/31/04, effective 11/1/04; 03-20-115, § 296-841-100, filed 10/1/03, effective 1/1/04.]

**WAC 296-841-200 Evaluate and control employee exposures.**

#### **Summary**

#### **Your responsibility:**

To protect your employees from exposure to respiratory hazards in the workplace by identifying and controlling the hazards.

#### **You must:**

Identify and evaluate employee exposures

WAC 296-841-20005

Control employee exposures

WAC 296-841-20010

Use respirators

WAC 296-841-20015

Notify employees

WAC 296-841-20020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17-060, 03-20-115, § 296-841-200, filed 10/1/03, effective 1/1/04.]

**WAC 296-841-20005 Identify and evaluate respiratory hazards.**

**You must:**

- Make sure employees are protected from potentially hazardous exposure while you perform your evaluation
- Perform your evaluation without considering the protection provided to employees by a respirator
- Determine the form of the hazard, such as dust, mist, gas, oxygen deficiency, or biological agent.
- Make sure you consider:
  - Potential emergency and rescue situations that may occur, such as equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error
  - Workplace conditions such as work processes, types of material, control methods, work practices and environmental conditions.
- Determine or reasonably estimate whether any employee is or could be exposed to any of the following:
  - Any airborne substance above a permissible exposure limit (PEL) listed in Table 3
  - A substance at or above the action level (AL) specified in the rule for that substance
  - Any other respiratory hazard.
- Use **any** of the following to determine employee exposure:
  - Information that would allow an estimate of the level of employee exposure, such as MSDSs or pesticide labels, observations, measurements or calculations
  - Data demonstrating that a particular product, material or activity cannot result in employee exposure at or above the AL or PEL
  - Personal air samples that represent an employee's usual or worst case exposure for the entire shift.

**Note:**

- Rules for specific substances may contain additional requirements for determining employee exposure.
- Use methods of sampling and analysis that have been validated by the laboratory performing the analysis.
- Samples from a representative group of employees may be used for other employees performing the same work activities when the duration and level of exposure are similar.

**You must:**

- Consider the atmosphere to be immediately dangerous to life or health (IDLH) when you cannot determine or reasonably estimate employee exposure
- Make sure employee exposure, to two or more substances with additive health effects, is evaluated using this formula:

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

The symbol	Is the . . .
E	Equivalent exposure for the mixture. <b>When the value of E is greater than 1, a respiratory hazard is present.</b>
C	Concentration of a substance.
L	TWA, STEL, or ceiling for that substance, from Table 3.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-18-079, § 296-841-20005, filed 8/31/04, effective 11/1/04; 03-20-115, § 296-841-20005, filed 10/1/03, effective 1/1/04.]

**WAC 296-841-20010 Control employee exposures.**

**You must:**

- Use feasible controls to protect employees from exposure to respiratory hazards by:
  - Reducing employee exposure to a level that removes the respiratory hazard, such as to a level below the permissible exposure limits (PEL) in Table 3;
- OR**
- Reducing the exposure to the lowest achievable level, when the respiratory hazard cannot be removed.

**IMPORTANT:**

Using respirators and other PPE is not a substitute for the feasible controls required by this section.

**Note:** The following table gives you examples of control methods.

**Table 1**  
**Examples of Possible Controls**

<b>Control:</b>	<b>For example:</b>
Using a different chemical (substitution)	<ul style="list-style-type: none"> <li>• Choose a chemical with a lower evaporation rate or vapor pressure</li> <li>• Choose a chemical without hazardous ingredients</li> </ul>
Changing a process to lessen emissions	<ul style="list-style-type: none"> <li>• Use hand rolling or paint dipping instead of paint spraying</li> <li>• Bolt items instead of welding them</li> </ul>
Separating employees from emissions areas and sources	<ul style="list-style-type: none"> <li>• Use control rooms</li> <li>• Build an enclosure around process machinery or other emissions sources</li> <li>• Automate a process</li> </ul>
Removing emissions at or near the source (local exhaust ventilation)	<ul style="list-style-type: none"> <li>• Install exhaust hoods or slots to capture emissions</li> <li>• Use an exhausted enclosure (like a blasting cabinet or laboratory hood)</li> </ul>
Diluting and removing emissions in the work area (general exhaust ventilation)	<ul style="list-style-type: none"> <li>• Allow natural air movement to create an adequate airflow through an area</li> <li>• Use mechanical fans</li> </ul>
Modify work practices	<ul style="list-style-type: none"> <li>• Change the position of the worker relative to the work so fumes, vapors, or smoke do not go into their face</li> </ul>
Rotate employees – Some specific rules prohibit the use of this control method	<ul style="list-style-type: none"> <li>• Move employees to another job that is without exposure, on a schedule to keep their total exposure below the permissible exposure limit</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-18-079, § 296-841-20010, filed 8/31/04, effective 11/1/04; 03-20-115, § 296-841-20010, filed 10/1/03, effective 1/1/04.]

**WAC 296-841-20015 Use respirators.**

**You must:**

• Require employees to use respiratory protection when respiratory hazards have not been removed using feasible controls. For example, use respirators at any of the following times:

- While controls are being evaluated or put in place
- When the respiratory hazard is not completely removed
- When controls are NOT feasible.

**Reference:**

See chapter 296-842 WAC, Respirators, for respirator program requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-115, § 296-841-20015, filed 10/1/03, effective 1/1/04.]

**WAC 296-841-20020 Notify employees.**

**You must:**

- Notify employees who are or may be exposed to respiratory hazards, as specified in Table 2.

**Note:** • The notification may be provided either individually, to a group, or by posting of results in an appropriate location that is accessible to affected employees.

**Table 2  
Notification Requirements**

Notify employees of:	As follows:
Any exposure result above a permissible exposure limit (PEL)	Within five business days, after the employee's exposure result is known to the employer
The corrective action being taken to reduce employee exposure to or below the PEL <b>AND</b> The schedule for completion of the corrective action and any reasons why exposures cannot be lowered to below the PEL	Within fifteen business days, after the employee's exposure result is known to the employer
An exposure to these substances:  <ul style="list-style-type: none"> <li>• Acrylonitrile</li> <li>• Arsenic (inorganic)</li> <li>• Asbestos</li> <li>• Benzene</li> <li>• Butadiene</li> <li>• Cadmium</li> <li>• Coke oven emissions</li> <li>• Cotton dust</li> <li>• 1,2-Dibromo-3-chloropropane</li> <li>• Ethylene oxide</li> <li>• Formaldehyde</li> <li>• Lead</li> <li>• Methylene chloride</li> </ul>	In writing, as specified in the rule specific to the substance

Notify employees of:	As follows:
<ul style="list-style-type: none"> <li>• Methylenedianiline</li> <li>• Vinyl chloride</li> </ul>	

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-18-079, § 296-841-20020, filed 8/31/04, effective 11/1/04; 03-20-115, § 296-841-20020, filed 10/1/03, effective 1/1/04.]

**WAC 296-841-20025 Permissible exposure limits of air contaminants.**

**IMPORTANT:**

The following information applies to Table 3, Permissible Exposure Limits for Air Contaminants.

- Exposure needs to be determined from personal air samples taken in the breathing zone OR from monitoring representative of the employee's breathing zone.
- Ppm refers to parts of vapor or gas per million parts of air by volume, at 25 degrees C and 760 mm Hg pressure.
- Mg/m<sup>3</sup> refers to milligrams of substance per cubic meter of air.
- For a metal that is measured as the metal itself, only the CAS number for the metal is given. The CAS numbers for individual compounds of the metal are not provided. For more information about CAS registry numbers see the web site: <http://www.cas.org>.
- Time weighted averages (TWA<sub>8</sub>) represent the maximum allowed average exposure for any 8-hour time period. For work periods longer than 8-hours the TWA<sub>8</sub> needs to be determined using the 8 continuous hours with the highest average concentration.
- Short-term exposure limits (STEL) represent maximum allowed average exposure for any fifteen-minute period, unless another time period is noted in Table 3.
- The ceiling represents the maximum allowed exposure for the shortest time period that can feasibly be measured.
- An "X" in the "skin" column indicates the substance can be absorbed through the skin, either by airborne or direct contact.
- Requirements for the use of gloves, coveralls, goggles, and other personal protective equipment can be found in WAC 296-800-160.
- The respirable fraction of particulate is measured by sampling with a size-selector having the following characteristics:

Mean aerodynamic diameter in micrometers	Percent passing the selector
1	97
2	91
3	74
4	50
5	30
6	17
7	9
8	5
10	1

**Table 3 "Permissible Exposure Limits for Air Contaminants"**

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Abate (Temephos)	3383-96-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Acetaldehyde	75-07-0	100 ppm	150 ppm	—	—
Acetic acid	64-19-7	10 ppm	20 ppm	—	—
Acetic anhydride	108-24-7	—	—	5 ppm	—
Acetone	67-64-1	750 ppm	1,000 ppm	—	—
Acetonitrile	75-05-8	40 ppm	60 ppm	—	—
2-Acetylaminofluorene (see WAC 296-62-073)	53-96-3	—	—	—	—
Acetylene	74-86-2	Simple asphyxiant	—	—	—
Acetylene dichloride (1,2-Dichloroethylene)	540-59-0	200 ppm	250 ppm	—	—
Acetylene tetrabromide	79-27-6	1 ppm	3 ppm	—	—
Acetylsalicylic acid (Aspirin)	50-78-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Acrolein	107-02-8	0.1 ppm	0.3 ppm	—	—
Acrylamide	79-06-1	0.03 mg/m <sup>3</sup>	0.09 mg/m <sup>3</sup>	—	X
Acrylic acid	79-10-7	10 ppm	20 ppm	—	X
Acrylonitrile (Vinyl cyanide) (see WAC 296-62-07336)	107-13-1	2 ppm	10 ppm	—	—
Aldrin	309-00-2	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Allyl alcohol	107-18-6	2 ppm	4 ppm	—	X
Allyl chloride	107-05-1	1 ppm	2 ppm	—	—
Allyl glycidyl ether (AGE)	106-92-3	5 ppm	10 ppm	—	—
Allyl propyl disulfide	2179-59-1	2 ppm	3 ppm	—	—
alpha-Alumina (Aluminum oxide)	1344-28-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Aluminum (as Al)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pyro powders	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Welding fumes	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Soluble salts	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Alkyls (NOC)	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Aluminum oxide (Alundum, Corundum)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
4-Aminodiphenyl (see WAC 296-62-073)	92-67-1	—	—	—	—
2-Aminoethanol (Ethanolamine)	141-43-5	3 ppm	6 ppm	—	—
2-Aminopyridine	504-29-0	0.5 ppm	1.5 ppm	—	—
Amitrole	61-82-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Ammonia	7664-41-7	25 ppm	35 ppm	—	—
Ammonium chloride, fume	12125-02-9	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Ammonium sulfamate (Ammate)	7773-06-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5.0 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
n-Amyl acetate	628-63-7	100 ppm	150 ppm	—	—
sec-Amyl acetate	626-38-0	125 ppm	156 ppm	—	—
Aniline and homologues	62-53-3	2 ppm	4 ppm	—	X
Anisidine (o, p-isomers)	29191-52-4	0.1 ppm	0.3 ppm	—	X
Antimony and compounds (as Sb)	7440-36-0	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
ANTU (alpha Naphthyl thiourea)	86-88-4	0.3 mg/m <sup>3</sup>	0.9 mg/m <sup>3</sup>	—	—
Argon	7440-37-1	Simple asphyxiant	—	—	—
Arsenic, organic compounds (as As)	7440-38-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Arsenic, inorganic compounds (as As) (when use is covered by WAC 296-62-07347)	7440-38-2	0.01 mg/m <sup>3</sup>	—	—	—
Arsenic, inorganic compounds (as As) (when use is not covered by WAC 296-62-07347)	7440-38-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Arsine	7784-42-1	0.05 ppm	0.15 ppm	—	—
Asbestos (see WAC 296-62-077)	—	—	—	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Asphalt (Petroleum fumes)	8052-42-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Atrazine	1912-24-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Azinphos methyl (Guthion)	86-50-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Azodrin (Monocrotophos)	6923-22-4	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	—
Barium, soluble compounds (as Ba)	7440-39-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Barium sulfate	7727-43-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Baygon (Propoxur)	114-26-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Benomyl	17804-35-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Benzene (see WAC 296-62-07523)	71-43-2	1 ppm	5 ppm	—	—
Benzidine (see WAC 296-62-073)	92-87-5	—	—	—	—
p-Benzoquinone (Quinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
Benzo(a) pyrene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Benzoyl peroxide	94-36-0	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Benzyl chloride	100-44-7	1 ppm	3 ppm	—	—
Beryllium and beryllium compounds (as Be)	7440-41-7	0.002 mg/m <sup>3</sup>	0.005 mg/m <sup>3</sup> (30 min.)	0.025 mg/m <sup>3</sup>	—
Biphenyl (Diphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Bismuth telluride, undoped	1304-82-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Bismuth telluride, Se-doped	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Borates, tetra, sodium salts	—	—	—	—	—
Anhydrous	1330-43-4	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Decahydrate	1303-96-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentahydrate	12179-04-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Boron oxide	1303-86-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Boron tribromide	10294-33-4	—	—	1 ppm	—
Boron trifluoride	6737-07-2	—	—	1 ppm	—
Bromacil	314-40-9	1 ppm	3 ppm	—	—
Bromine	7726-95-6	0.1 ppm	0.3 ppm	—	—
Bromine pentafluoride	7789-30-2	0.1 ppm	0.3 ppm	—	—
Bromochloromethane (Chlorobromomthane)	74-97-5	200 ppm	250 ppm	—	—
Bromoform	15-25-2	0.5 ppm	1.5 ppm	—	X
Butadiene (1,3-butadiene)	106-99-0	1 ppm	5 ppm	—	—
Butane	106-97-8	800 ppm	1,000 ppm	—	—
Butanethiol (Butyl mercaptan)	109-79-5	0.5 ppm	1.5 ppm	—	—
2-Butanone (Methyl ethyl ketone)	78-93-3	200 ppm	300 ppm	—	—
2-Butoxy ethanol (Butyl cellosolve)	111-76-2	25 ppm	38 ppm	—	X
n-Butyl acetate	123-86-4	150 ppm	200 ppm	—	—
sec-Butyl acetate	105-46-4	200 ppm	250 ppm	—	—
tert-Butyl acetate	540-88-5	200 ppm	250 ppm	—	—
Butyl acrylate	141-32-2	10 ppm	20 ppm	—	—
n-Butyl alcohol	71-36-3	—	—	50 ppm	X
sec-Butyl alcohol	78-92-2	100 ppm	150 ppm	—	—
tert-Butyl alcohol	75-65-0	100 ppm	150 ppm	—	—
Butylamine	109-73-9	—	—	5 ppm	X
Butyl cellosolve (2-Butoxy ethanol)	111-76-2	25 ppm	38 ppm	—	—
tert-Butyl chromate (as CrOs)	1189-85-1	—	—	0.1 mg/m <sup>3</sup>	X
n-Butyl glycidyl ether (BGE)	2426-08-6	25 ppm	38 ppm	—	—
n-Butyl lactate	138-22-7	5 ppm	10 ppm	—	—
Butyl mercaptan	109-79-5	0.5 ppm	1.5 ppm	—	—
o-sec-Butylphenol	89-72-5	5 ppm	10 ppm	—	X
p-tert-Butyl-toluene	98-51-1	10 ppm	20 ppm	—	—
Cadmium oxide fume (as Cd) (see WAC 296-62-074)	1306-19-0	0.005 mg/m <sup>3</sup>	—	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Cadmium dust and salts (as Cd) (see WAC 296-62-074)	7440-43-9	0.005 mg/m <sup>3</sup>	—	—	—
Calcium arsenate (see WAC 296-62-07347)	—	0.01 mg/m <sup>3</sup>	—	—	—
Calcium carbonate	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium cyanamide	156-62-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Calcium hydroxide	1305-62-0	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium oxide	1305-78-8	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Calcium silicate	1344-95-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium sulfate	7778-18-9	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Camphor (synthetic)	76-22-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Caprolactam	105-60-2	—	—	—	—
Dust	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Vapor	—	5 ppm	10 ppm	—	—
Captafol (Difolatan)	2425-06-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Captan	133-06-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Carbaryl (Sevin)	63-25-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Carbofuran (Furadon)	1563-66-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Carbon black	1333-86-4	3.5 mg/m <sup>3</sup>	7 mg/m <sup>3</sup>	—	—
Carbon dioxide	124-38-9	5,000 ppm	30,000 ppm	—	—
Carbon disulfide	75-15-0	4 ppm	12 ppm	—	X
Carbon monoxide	630-08-0	35 ppm	200 ppm (5 min.)	1,500 ppm	—
Carbon tetrabromide	558-13-4	0.1 ppm	0.3 ppm	—	—
Carbon tetrachloride (Tetrachloromethane)	56-23-5	2 ppm	4 ppm	—	X
Carbonyl chloride (Phosgene)	7803-51-2	0.1 ppm	0.3 ppm	—	—
Carbonyl fluoride	353-50-4	2 ppm	5 ppm	—	—
Catechol (Pyrocatechol)	120-80-9	5 ppm	10 ppm	—	X
Cellosolve acetate (2-Ethoxyethylacetate)	111-15-9	5 ppm	10 ppm	—	X
Cellulose (paper fiber)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cesium hydroxide	21351-79-1	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Chlordane	57-74-9	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Chlorinated camphene (Toxaphen)	8001-35-2	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	—	X
Chlorinated diphenyl oxide	55720-99-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chlorine	7782-50-5	0.5 ppm	—	1 ppm	—
Chlorine dioxide	10049-04-4	0.1 ppm	0.3 ppm	—	—
Chlorine trifluoride	7790-91-2	—	—	0.1 ppm	—
Chloroacetaldehyde	107-20-0	—	—	1 ppm	—
a-Chloroacetophenone (Phenacyl chloride)	532-21-4	0.05 ppm	0.15 ppm	—	—
Chloroacetyl chloride	79-04-9	0.05 ppm	0.15 ppm	—	—
Chlorobenzene (Monochlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
o-Chlorobenzylidene malononitrile (OCBM)	2698-41-1	—	—	0.05 ppm	X
Chlorobromomethane	74-97-5	200 ppm	250 ppm	—	—
2-Chloro-1, 3-butadiene (beta-Chloroprene)	126-99-8	10 ppm	20 ppm	—	X
Chlorodifluoromethane	75-45-6	1,000 ppm	1,250 ppm	—	—
Chlorodiphenyl (42% Chlorine) (PCB) (Polychlorobiphenyls)	53469-21-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Chlorodiphenyl (54% Chlorine) (Polychlorobiphenyls (PCB))	11097-69-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
1-Chloro-2, 3-epoxypropane (Epichlorhydrin)	106-89-8	2 ppm	4 ppm	—	X
2-Chloroethanol (Ethylene chlorohydrin)	107-07-3	—	—	1 ppm	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Chloroethylene (vinyl chloride) (See WAC 296-62-07329)	75-01-4	1 ppm	5 ppm	—	—
Chloroform (Trichloromethane)	67-66-3	2 ppm	4 ppm	—	—
1-Chloro-1-nitropropane	600-25-9	2 ppm	4 ppm	—	—
bis-Chloromethyl ether (see WAC 296-62-073)	542-88-1	—	—	—	—
Chloromethyl methyl ether (Methyl chloromethyl ether) (see WAC 296-62-073)	107-30-2	—	—	—	—
Chloropentafluoroethane	76-15-3	1,000 ppm	1,250 ppm	—	—
Chloropicrin (Nitrotrichloromethane)	76-06-2	0.1 ppm	0.3 ppm	—	—
beta-Chloroprene (2-Chloro-1, 3-butadiene)	126-99-8	10 ppm	20 ppm	—	X
o-Chlorostyrene	2039-87-4	50 ppm	75 ppm	—	—
o-Chlorotoluene	95-49-8	50 ppm	75 ppm	—	—
2-Chloro-6-trichloromethyl pyridine (Nitrapyrin)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Chlorpyrifos	2921-88-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Chromic acid and chromates (as CrO <sub>3</sub> )	Varies with compound	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Chromium, soluble, chromic and chromous salts (as Cr)	7440-47-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chromium (VI) compounds (as Cr)	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Chromium metal and insoluble salts	7440-47-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chromyl chloride	14977-61-8	0.025 ppm	0.075 ppm	—	—
Chrysene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Clopidol	2971-90-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Coal dust (less than 5% SiO <sub>2</sub> ) Respirable fraction	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Coal dust (greater than or equal to 5% SiO <sub>2</sub> ) Respirable fraction	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Coal tar pitch volatiles (benzene soluble fraction) (Particulate polycyclic aromatic hydrocarbons)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Cobalt, metal fume & dust (as Co)	7440-48-4	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Cobalt carbonyl (as Co)	10210-68-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Cobalt hydrocarbonyl (as Co)	16842-03-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Coke oven emissions (see WAC 296-62-200)	—	0.15 mg/m <sup>3</sup>	—	—	—
Copper (as Cu)	7440-50-8	—	—	—	—
Fume	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Dusts and mists	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Cotton dust (raw) (waste sorting, blend- ing, cleaning, willowing and garetting) (see WAC 296-62-14533)	—	1 mg/m <sup>3</sup>	—	—	—
Corundum (Aluminum oxide)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Crag herbicide (Sesone, Sodium-2, 4-dichloro-phenoxyethyl sulfate)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cresol (all isomers)	1319-77-3	5 ppm	10 ppm	—	X
Crotonaldehyde	123-73-9; 4170-30-3	2 ppm	4 ppm	—	—
Crufomate	299-86-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cumene	98-82-8	50 ppm	75 ppm	—	X
Cyanamide	420-04-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Cyanide (as CN)	Varies with compound	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
Cyanogen	460-19-5	10 ppm	20 ppm	—	—
Cyanogen chloride	506-77-4	—	—	0.3 ppm	—
Cyclohexane	110-82-7	300 ppm	375 ppm	—	—
Cyclohexanol	108-93-0	50 ppm	75 ppm	—	X
Cyclohexanone	108-94-1	25 ppm	38 ppm	—	X
Cyclohexene	110-83-8	300 ppm	375 ppm	—	—
Cyclohexylamine	108-91-8	10 ppm	20 ppm	—	—
Cyclonite (RDX)	121-82-4	1.5 mg/m <sup>3</sup>	3.0 mg/m <sup>3</sup>	—	X
Cyclopentadiene	542-92-7	75 ppm	113 ppm	—	—
Cyclopentane	287-92-3	600 ppm	750 ppm	—	—
Cyhexatin (Tricyclohexyltin hydroxide)	13121-70-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
2,4-D (Dichlorophenoxy-acetic acid)	94-75-7	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
DBCP (1,2-Dibromo-3-chloropropane) (See WAC 296-62-07342)	96-12-8	0.001 ppm	—	0.005 ppm	—
DDT (Dichlorodiphenyltri-chloroethane)	50-29-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
DDVP, (Dichlorvos)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dasanit (Fensulfothion)	115-90-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Decaborane	17702-41-9	0.05 ppm	0.15 ppm	—	X
Demeton	8065-48-3	0.01 ppm	0.03 ppm	—	X
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	50 ppm	75 ppm	—	—
1, 2-Diaminoethane (Ethylenediamine)	107-15-3	10 ppm	20 ppm	—	—
Diazinon	333-41-5	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Diazomethane	334-88-3	0.2 ppm	0.6 ppm	—	—
Diborane	19287-45-7	0.1 ppm	0.3 ppm	—	—
Dibrom (see Naled)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
1, 2-Dibromo-3-chloropropane (DBCP) (see WAC 296-62-07342)	96-12-8	0.001 ppm	—	0.005 ppm	—
2-N-Dibutylamino ethanol	102-81-8	2 ppm	4 ppm	—	X
Dibutyl phosphate	107-66-4	1 ppm	2 ppm	—	—
Dibutyl phthalate	84-74-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dichloroacetylene	7572-29-4	—	—	0.1 ppm	—
o-Dichlorobenzene	95-50-1	—	—	50 ppm	—
p-Dichlorobenzene	106-46-7	75 ppm	110 ppm	—	—
3, 3'-Dichlorobenzidine (see WAC 296-62-073)	91-94-1	—	—	—	—
Dichlorodiphenyltri-chloroethane (DDT)	50-29-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Dichlorodifluoromethane	75-71-8	1,000 ppm	1,250 ppm	—	—
1, 3-Dichloro-5, 5-dimethyl hydantoin	118-52-5	0.2 mg/m <sup>3</sup>	0.4 mg/m <sup>3</sup>	—	—
1, 1-Dichloroethane (Ethylidene chloride)	75-34-3	100 ppm	150 ppm	—	—
1, 2-Dichloroethane (Ethylene dichloride)	107-06-2	1 ppm	2 ppm	—	—
1, 1-Dichloroethylene (Vinylidene chloride)	75-35-4	1 ppm	3 ppm	—	—
1, 2-Dichloroethylene (Acetylene dichloride)	540-59-0	200 ppm	250 ppm	—	—
Dichloroethyl ether	111-44-4	5 ppm	10 ppm	—	X
Dichlorofluoromethane	75-43-4	10 ppm	20 ppm	—	—
Dichloromethane (Methylene chloride) (See WAC 296-62-07470)	75-09-2	25 ppm	125 ppm	—	—
1, 1-Dichloro-1-nitroethane	594-72-9	2 ppm	10 ppm	—	—
Dichlorophenoxyacetic acid (2, 4-D)	94-75-7	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
1, 2-Dichloropropane (Propylene dichloride)	78-87-5	75 ppm	110 ppm	—	—
Dichloropropene	542-75-6	1 ppm	3 ppm	—	X
2, 2-Dichloropropionic acid	75-99-0	1 ppm	3 ppm	—	—
Dichlorotetrafluoroethane	76-14-2	1,000 ppm	1,250 ppm	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Dichlorvos (DDVP)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dicrotophos	141-66-2	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Dicyclopentadiene	77-73-6	5 ppm	10 ppm	—	—
Dicyclopentadienyl iron	102-54-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dieldrin	60-57-1	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Diethanolamine	111-42-2	3 ppm	6 ppm	—	—
Diethylamine	109-89-7	10 ppm	25 ppm	—	—
2-Diethylaminoethanol	100-37-8	10 ppm	20 ppm	—	X
Diethylene triamine	111-40-0	1 ppm	3 ppm	—	X
Diethyl ether (Ethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Diethyl ketone	96-22-0	200 ppm	250 ppm	—	—
Diethyl phthalate	84-66-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Difluorodibromomethane	75-61-6	100 ppm	150 ppm	—	—
Difolatan (Captafol)	2425-06-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Diglycidyl ether (DGE)	2238-07-5	0.1 ppm	0.3 ppm	—	—
Dihydroxybenzene (Hydroquinone)	123-31-9	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Diisobutyl ketone (2, 6-Dimethylheptanone)	108-83-8	25 ppm	38 ppm	—	—
Diisopropylamine	108-18-9	5 ppm	10 ppm	—	X
Dimethoxymethane (Methylal)	109-87-5	1,000 ppm	1,250 ppm	—	—
Dimethyl acetamide	127-19-5	10 ppm	20 ppm	—	X
Dimethylamine	124-40-3	10 ppm	20 ppm	—	—
4-Dimethylaminoazo benzene (see WAC 296-62-073)	60-11-7	—	—	—	—
Dimethylaminobenzene (Xylidene)	1300-73-8	2 ppm	4 ppm	—	X
Dimethylaniline (N, N-Dimethylaniline)	121-69-7	5 ppm	10 ppm	—	X
Dimethylbenzene (Xylene)	1300-73-8	100 ppm	150 ppm	—	—
Dimethyl-1, 2-dibromo-2, 2-dichloroethyl phosphate (Naled)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Dimethylformamide	68-12-2	10 ppm	20 ppm	—	X
2, 6-Dimethylheptanone (Diisobutyl ketone)	108-83-8	25 ppm	38 ppm	—	—
1, 1-Dimethylhydrazine	57-14-7	0.5 ppm	1.5 ppm	—	X
Dimethyl phthalate	131-11-3	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dimethyl sulfate	77-78-1	0.1 ppm	0.3 ppm	—	X
Dinitolmide (3, 5-Dinitro-o-toluamide)	148-01-6	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dinitrobenzene (all isomers - alpha, meta and para)	528-29-0; 99-65-0;	—	—	—	—
	100-25-4	0.15 ppm	0.45 ppm	—	X
Dinitro-o-cresol	534-52-1	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
3, 5-Dinitro-o-toluamide (Dinitolmide)	148-01-6	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dinitrotoluene	25321-14-6	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Dioxane (Diethylene dioxide)	123-91-1	25 ppm	38 ppm	—	X
Dioxathion	78-34-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Diphenyl (Biphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Diphenylamine	122-39-4	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Diphenylmethane diisocyanate (Methylene bisphenyl isocyanate (MDI))	101-68-8	—	—	0.02 ppm	—
Dipropylene glycol methyl ether	34590-94-8	100 ppm	150 ppm	—	X
Dipropyl ketone	123-19-3	50 ppm	75 ppm	—	—
Diquat	85-00-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Di-sec, Octyl phthalate (Di-2-ethylhexylphthalate)	117-81-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Disulfiram	97-77-8	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Disulfoton	298-04-4	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
2, 6-Di-tert-butyl-p-cresol	128-37-0	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Diuron	330-54-1	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Divinyl benzene	1321-74-0	10 ppm	20 ppm	—	—
Emery	12415-34-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Endosulfan (Thiodan)	115-29-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Endrin	72-20-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	106-89-8	2 ppm	4 ppm	—	X
EPN	2104-64-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
1, 2-Epoxypropane (Propylene oxide)	75-56-9	20 ppm	30 ppm	—	—
2, 3-Epoxy-1-propanol (Glycidol)	556-52-5	25 ppm	38 ppm	—	—
Ethane	—	Simple asphyxiant	—	—	—
Ethanethiol (Ethyl mercaptan)	75-08-1	0.5 ppm	1.5 ppm	—	—
Ethanol (Ethyl alcohol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethanolamine (2-Aminoethanol)	141-43-5	3 ppm	6 ppm	—	—
Ethion	563-12-2	0.4 mg/m <sup>3</sup>	1.2 mg/m <sup>3</sup>	—	X
2-Ethoxyethanol (Glycol monoethyl ether)	110-80-5	5 ppm	10 ppm	—	X
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	5 ppm	10 ppm	—	X
Ethyl acetate	141-78-6	400 ppm	500 ppm	—	—
Ethyl acrylate	140-88-5	5 ppm	25 ppm	—	X
Ethyl alcohol (ethanol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethylamine	75-04-07	10 ppm	20 ppm	—	—
Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl benzene	100-41-4	100 ppm	125 ppm	—	—
Ethyl bromide	74-96-4	200 ppm	250 ppm	—	—
Ethyl butyl ketone (3-Heptanone)	106-35-4	50 ppm	75 ppm	—	—
Ethyl chloride	75-00-3	1,000 ppm	1,250 ppm	—	—
Ethylene	74-85-1	Simple asphyxiant	—	—	—
Ethylene chlorohydrin (2-Chloroethanol)	107-07-3	—	—	1 ppm	X
Ethylenediamine (1,2-Diaminoethane)	107-15-3	10 ppm	20 ppm	—	X
Ethylene dibromide	106-93-4	0.1 ppm	0.5 ppm	—	—
Ethylene dichloride (1,2-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylene glycol	107-21-1	—	—	50 ppm	—
Ethylene glycol dinitrate	628-96-6	—	0.1 mg/m <sup>3</sup>	—	X
Ethylene glycol monomethyl ether acetate (Methyl cellosolve acetate)	—	5 ppm	10 ppm	—	X
Ethyleneimine (see WAC 296-62-073)	151-56-4	—	—	—	X
Ethylene oxide (see WAC 296-62-07359)	75-21-8	1 ppm	5 ppm	—	—
Ethyl ether (Diethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Ethyl formate	109-94-4	100 ppm	125 ppm	—	—
Ethylidene chloride (1, 1-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylidene norbornene	16219-75-3	—	—	5.0 ppm	—
Ethyl mercaptan (Ethanethiol)	75-08-1	0.5 ppm	1.5 ppm	—	—
n-Ethylmorpholine	100-74-3	5 ppm	10 ppm	—	X
Ethyl sec-amyl ketone (5-methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl silicate	78-10-4	10 ppm	20 ppm	—	—
Fenamiphos	22224-92-6	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Fensulfothion (Dasanit)	115-90-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Fenthion	55-38-9	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Ferbam	—	—	—	—	—
Total particulate	14484-64-1	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Ferrovandium dust	12604-58-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Fluorides (as F)	Varies with compound	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Fluorine	7782-41-4	0.1 ppm	0.3 ppm	—	—
Fluorotrichloromethane (see Trichlorofluoro methane)	75-69-4	—	—	1,000 ppm	—
Fonofos	944-22-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Formaldehyde (see WAC 296-62-07540)	50-00-0	0.75 ppm	2 ppm	—	—
Formamide	75-12-7	20 ppm	30 ppm	—	—
Formic acid	64-18-6	5 ppm	10 ppm	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Furadon (carbofuran)	1563-66-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Furfural	98-01-1	2 ppm	4 ppm	—	X
Furfuryl alcohol	98-00-0	10 ppm	15 ppm	—	X
Gasoline	8006-61-9	300 ppm	500 ppm	—	—
Germanium tetrahydride	7782-65-2	0.2 ppm	0.6 ppm	—	—
Glass, fibrous or dust	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Gluteraldehyde	111-30-8	—	—	0.2 ppm	—
Glycerin mist	56-81-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Glycidol (2, 3-Epoxy-1-propanol)	556-52-5	25 ppm	38 ppm	—	—
Glycol monoethyl ether (2-Ethoxyethanol)	110-80-5	5 ppm	10 ppm	—	X
Grain dust (oat, wheat, barley)	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Graphite, natural	7782-42-5	—	—	—	—
Respirable particulate	—	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Graphite, synthetic	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Guthion (Azinphosmethyl)	86-50-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Gypsum	13397-24-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Hafnium	7440-58-6	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Helium	—	Simple asphyxiant	—	—	—
Heptachlor	76-44-8	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Heptane (n-heptane)	142-82-5	400 ppm	500 ppm	—	—
2-Heptanone (Methyl n-amyl ketone)	110-43-0	50 ppm	75 ppm	—	—
3-Heptanone (Ethyl butyl ketone)	106-35-4	50 ppm	75 ppm	—	—
Hexachlorobutadiene	87-68-3	0.02 ppm	0.06 ppm	—	X
Hexachlorocyclopentadiene	77-47-4	0.01 ppm	0.03 ppm	—	—
Hexachloroethane	67-72-1	1 ppm	3 ppm	—	X
Hexachloronaphthalene	1335-87-1	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Hexafluoroacetone	684-16-2	0.1 ppm	0.3 ppm	—	X
Hexane n-hexane	110-54-3	50 ppm	75 ppm	—	—
other isomers	Varies with compound	500 ppm	1,000 ppm	—	—
2-Hexanone (Methyl-n-butyl ketone)	591-78-6	5 ppm	10 ppm	—	—
Hexone (Methyl isobutyl ketone)	108-10-1	50 ppm	75 ppm	—	—
sec-Hexyl acetate	108-84-9	50 ppm	75 ppm	—	—
Hexylene glycol	107-41-5	—	—	25 ppm	—
Hydrazine	302-01-2	0.1 ppm	0.3 ppm	—	X
Hydrogen	—	Simple asphyxiant	—	—	—
Hydrogenated terphenyls	61788-32-7	0.5 ppm	1.5 ppm	—	—
Hydrogen bromide	10035-10-6	—	—	3.0 ppm	—
Hydrogen chloride	7647-01-0	—	—	5.0 ppm	—
Hydrogen cyanide	74-90-8	—	4.7 ppm	—	X
Hydrogen fluoride	7664-39-3	—	—	3 ppm	—
Hydrogen peroxide	7722-84-1	1 ppm	3 ppm	—	—
Hydrogen selenide (as Se)	7783-07-5	0.05 ppm	0.15 ppm	—	—
Hydrogen sulfide	7783-06-4	10 ppm	15 ppm	—	—
Hydroquinone (Dihydroxybenzene)	123-31-9	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	123-42-2	50 ppm	75 ppm	—	—
2-Hydroxypropyl acrylate	99-61-1	0.5 ppm	1.5 ppm	—	X
Indene	95-13-6	10 ppm	20 ppm	—	—
Indium and compounds (as In)	7440-74-6	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Iodine	7553-56-2	—	—	0.1 ppm	—
Iodoform	75-47-8	0.6 ppm	1.8 ppm	—	—
Iron oxide dust and fume (as Fe) Total particulate	1309-37-1	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Iron pentacarbonyl (as Fe)	13463-40-6	0.1 ppm	0.2 ppm	—	—
Iron salts, soluble (as Fe)	Varies with compound	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Isoamyl acetate	123-92-2	100 ppm	150 ppm	—	—
Isoamyl alcohol (primary and secondary)	123-51-3	100 ppm	125 ppm	—	—
Isobutyl acetate	110-19-0	150 ppm	188 ppm	—	—
Isobutyl alcohol	78-83-1	50 ppm	75 ppm	—	—
Isooctyl alcohol	26952-21-6	50 ppm	75 ppm	—	X
Isophorone	78-59-1	4 ppm	—	5 ppm	—
Isophorone diisocyanate	4098-71-9	0.005 ppm	0.02 ppm	—	X
Isopropoxyethanol	109-59-1	25 ppm	38 ppm	—	—
Isopropyl acetate	108-21-4	250 ppm	310 ppm	—	—
Isopropyl alcohol	67-63-0	400 ppm	500 ppm	—	—
Isopropylamine	75-31-0	5 ppm	10 ppm	—	—
N-Isopropylaniline	768-52-5	2 ppm	4 ppm	—	X
Isopropyl ether	108-20-3	250 ppm	313 ppm	—	—
Isopropyl glycidyl ether (IGE)	4016-14-2	50 ppm	75 ppm	—	—
Kaolin	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Ketene	463-51-4	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Lannate (Methomyl)	16752-77-5	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Lead, inorganic (as Pb) (see WAC 296-62-07521 and 296-155-176)	7439-92-1	0.05 mg/m <sup>3</sup>	—	—	—
Lead arsenate (as Pb) (see WAC 296-62-07347)	3687-31-8	0.05 mg/m <sup>3</sup>	—	—	—
Lead chromate (as Pb)	7758-97-6	0.05 mg/m <sup>3</sup>	—	—	—
Limestone	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Lindane	58-89-9	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Lithium hydride	7580-67-8	0.025 mg/m <sup>3</sup>	0.075 mg/m <sup>3</sup>	—	—
L.P.G. (liquified petroleum gas)	68476-85-7	1,000 ppm	1,250 ppm	—	—
Magnesite	546-93-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Magnesium oxide fume	1309-48-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Malathion	121-75-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	X
Maleic anhydride	108-31-6	0.25 ppm	0.75 ppm	—	—
Manganese and compounds (as Mn)	7439-96-5	—	—	5 mg/m <sup>3</sup>	—
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Manganese tetroxide and fume (as Mn)	7439-96-5	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Marble	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
MBOCA (4, 4'-Methylene bis (2-chloro-aniline)) (see WAC 296-62-073)	101-14-4	—	—	—	X
MDA (4, 4-Methylene dianiline) (see WAC 296-62-076)	101-77-9	0.01 ppm	0.1 ppm	—	X
MDI (Methylene bisphenyl isocyanate) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
MEK (Methyl ethyl ketone) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
MEKP (Methyl ethyl ketone peroxide)	1338-23-4	—	—	0.2 ppm	—
Mercury (as Hg)	7439-97-6	—	—	—	—
Aryl and inorganic	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Organo-alkyl compounds	—	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>	—	X
Vapor	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	X
Mesityl oxide	141-79-7	15 ppm	25 ppm	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Methacrylic acid	79-41-4	20 ppm	30 ppm	—	X
Methane	—	Simple asphyxiant	—	—	—
Methanethiol (Methyl mercaptan)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methanol (Methyl alcohol)	67-56-1	200 ppm	250 ppm	—	X
Methomyl (lannate)	16752-77-5	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Methoxychlor	72-43-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
2-Methoxyethanol (Methyl cellosolve)	109-86-4	5 ppm	10 ppm	—	X
2-Methoxyethyl acetate (Methyl cellosolve acetate)	110-49-6	5 ppm	10 ppm	—	X
4-Methoxyphenol	150-76-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Methyl acetate	79-20-9	200 ppm	250 ppm	—	—
Methyl acetylene (propyne)	74-99-7	1,000 ppm	1,250 ppm	—	—
Methyl acetylene-propadiene mixture (MAPP)	—	1,000 ppm	1,250 ppm	—	—
Methyl acrylate	96-33-3	10 ppm	20 ppm	—	X
Methylacrylonitrile	126-98-7	1 ppm	3 ppm	—	X
Methylal (Dimethoxy-methane)	109-87-5	1,000 ppm	1,250 ppm	—	—
Methyl alcohol (methanol)	67-56-1	200 ppm	250 ppm	—	X
Methylamine	74-89-5	10 ppm	20 ppm	—	—
Methyl amyl alcohol (Methyl isobutyl carbinol)	108-11-2	25 ppm	40 ppm	—	X
Methyl n-amyl ketone (2-Heptanone)	110-43-0	50 ppm	75 ppm	—	—
N-Methyl aniline (Monomethyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X
Methyl bromide	74-83-9	5 ppm	10 ppm	—	X
Methyl-n-butyl ketone (2-Hexanone)	591-78-6	5 ppm	10 ppm	—	—
Methyl cellosolve (2-Methoxyethanol)	109-86-4	5 ppm	10 ppm	—	X
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	5 ppm	10 ppm	—	X
Methyl chloride	74-87-3	50 ppm	100 ppm	—	—
Methyl chloroform (1, 1, 1-trichlorethane)	71-55-6	350 ppm	450 ppm	—	—
Methyl chloromethyl ether (chloromethyl methyl ether) (see WAC 296-62-073)	107-30-2	—	—	—	—
Methyl 2-cyanoacrylate	137-05-3	2 ppm	4 ppm	—	—
Methylcyclohexane	108-87-2	400 ppm	500 ppm	—	—
Methylcyclohexanol	25639-42-3	50 ppm	75 ppm	—	—
Methylcyclohexanone	583-60-8	50 ppm	75 ppm	—	X
Methylcyclopentadienyl manganese tricarbonyl (as Mn)	12108-13-3	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Methyl demeton	8022-00-2	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Methylene bisphenyl isocyanate (MDI) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
4, 4'-Methylene bis (2-chloro-aniline) (MBOCA) (see WAC 296-62-073)	101-14-4	—	—	—	X
Methylene bis (4-cyclohexylisocyanate)	5124-30-1	—	—	0.01 ppm	—
Methylene chloride (Dichloromethane) (see WAC 296-62-07470)	75-09-2	25 ppm	125 ppm	—	—
4, 4-Methylene dianiline (MDA) (see WAC 296-62-076)	101-77-9	0.01 ppm	0.1 ppm	—	X
Methyl ethyl ketone (MEK) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
Methyl ethyl ketone peroxide (MEKP)	1338-23-4	—	—	0.2 ppm	—
Methyl formate	107-31-3	100 ppm	150 ppm	—	—
5-Methyl-3-heptanone (Ethyl amyl ketone)	541-85-5	25 ppm	38 ppm	—	—
Methyl hydrazine (Monomethyl hydrazine)	60-34-4	—	—	0.2 ppm	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Methyl iodide	74-88-4	2 ppm	4 ppm	—	X
Methyl isoamyl ketone	110-12-3	50 ppm	75 ppm	—	—
Methyl isobutyl carbinol (Methyl amyl alcohol)	108-11-2	25 ppm	40 ppm	—	X
Methyl isobutyl ketone (Hexone)	108-10-1	50 ppm	75 ppm	—	—
Methyl isocyanate	624-83-9	0.02 ppm	0.06 ppm	—	X
Methyl isopropyl ketone	563-80-4	200 ppm	250 ppm	—	—
Methyl mercaptan (Methanethiol)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methyl methacrylate	80-62-6	100 ppm	150 ppm	—	—
Methyl parathion	298-00-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Methyl propyl ketone (2-Pentanone)	107-87-9	200 ppm	250 ppm	—	—
Methyl silicate	684-84-5	1 ppm	3 ppm	—	—
alpha-Methyl styrene	98-83-9	50 ppm	100 ppm	—	—
Mevinphos (Phosdrin)	7786-34-7	0.01 ppm	0.03 ppm	—	X
Metribuzin	21087-64-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Mica (Silicates)					
Respirable fraction	12001-26-2	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Molybdenum (as Mo)	7439-98-7	—	—	—	—
Soluble compounds	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Monochlorobenzene (Chlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
Monocrotophos (Azodrin)	6923-22-4	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	—
Monomethyl aniline (N-Methyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X
Monomethyl hydrazine	—	—	—	0.2 ppm	—
Morpholine	110-91-8	20 ppm	30 ppm	—	X
Naled (Dibrom)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Naphtha	8030-30-6	100 ppm	150 ppm	—	X
Naphthalene	91-20-3	10 ppm	15 ppm	—	—
alpha-Naphthylamine (see WAC 296-62-073)	134-32-7	—	—	—	—
beta-Naphthylamine (see WAC 296-62-073)	91-59-8	—	—	—	—
Neon	7440-01-9	Simple asphyxiant	—	—	—
Nickel carbonyl (as Ni)	13463-39-3	0.001 ppm	0.003 ppm	—	—
Nickel (as Ni)	7440-02-0	—	—	—	—
Metal and insoluble compounds	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Soluble compounds	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Nicotine	54-11-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Nitrapyrin (2-Chloro-6 trichloromethyl pyridine)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Nitric acid	7697-37-2	2 ppm	4 ppm	—	—
Nitric oxide	10102-43-9	25 ppm	38 ppm	—	—
p-Nitroaniline	100-01-6	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Nitrobenzene	98-95-3	1 ppm	3 ppm	—	X
4-Nitrobiphenyl (see WAC 296-62-073)	92-93-3	—	—	—	—
p-Nitrochlorobenzene	100-00-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
4-Nitrodiphenyl (see WAC 296-62-073)	—	—	—	—	—
Nitroethane	79-24-3	100 ppm	150 ppm	—	—
Nitrogen	7727-37-9	Simple asphyxiant	—	—	—
Nitrogen dioxide	10102-44-0	—	1 ppm	—	—
Nitrogen oxide (Nitrous oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nitrogen trifluoride	7783-54-2	10 ppm	20 ppm	—	—
Nitroglycerin	55-63-0	—	0.1 mg/m <sup>3</sup>	—	X
Nitromethane	75-52-5	100 ppm	150 ppm	—	—
1-Nitropropane	108-03-2	25 ppm	38 ppm	—	—
2-Nitropropane	79-46-9	10 ppm	20 ppm	—	—
N-Nitrosodimethylamine (see WAC 296-62-073)	62-75-9	—	—	—	—
Nitrotoluene	—	—	—	—	—
o-isomer	88-72-2	2 ppm	4 ppm	—	X
m-isomer	98-08-2	2 ppm	4 ppm	—	X
p-isomer	99-99-0	2 ppm	4 ppm	—	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Nitrotrichloromethane (Chloropicrin)	76-06-2	0.1 ppm	0.3 ppm	—	—
Nitrous oxide (Nitrogen oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nonane	111-84-2	200 ppm	250 ppm	—	—
Octachloronaphthalene	2234-13-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Octane	111-65-9	300 ppm	375 ppm	—	—
Oil mist mineral (particulate)	8012-95-1	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Osmium tetroxide (as Os)	20816-12-0	0.0002 ppm	0.0006 ppm	—	—
Oxalic acid	144-62-7	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	—	—
Oxygen difluoride	7783-41-7	—	—	0.05 ppm	—
Ozone	10028-15-6	0.1 ppm	0.3 ppm	—	—
Paper fiber					
(Cellulose)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Paraffin wax fume	8002-74-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Paraquat					
Respirable fraction	4685-14-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
	1910-42-5				
	2074-50-2				
Parathion	56-38-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Particulate polycyclic aromatic hydrocarbons (benzene soluble fraction) (coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Particulates not otherwise regulated	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentaborane	19624-22-7	0.005 ppm	0.015 ppm	—	—
Pentachloronaphthalene	1321-64-8	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Pentachlorophenol	87-86-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Pentaerythritol	115-77-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentane	109-66-0	600 ppm	750 ppm	—	—
2-Pentanone (methyl propyl ketone)	107-87-9	200 ppm	250 ppm	—	—
Perchloroethylene (tetrachloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Perchloromethyl mercaptan	594-42-3	0.1 ppm	0.3 ppm	—	—
Perchloryl fluoride	7616-94-6	3 ppm	6 ppm	—	—
Perlite					
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Petroleum distillates (Naptha, rubber solvent)	—	100 ppm	150 ppm	—	—
Phenacyl chloride (a-Chloroacetophenone)	532-21-4	0.05 ppm	0.15 ppm	—	—
Phenol	108-95-2	5 ppm	10 ppm	—	X
Phenothiazine	92-84-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
p-Phenylene diamine	106-50-3	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Phenyl ether (vapor)	101-84-8	1 ppm	3 ppm	—	—
Phenyl ether-diphenyl mixture (vapor)	—	1 ppm	3 ppm	—	—
Phenylethylene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Phenyl glycidyl ether (PGE)	122-60-1	1 ppm	3 ppm	—	—
Phenylhydrazine	100-63-0	5 ppm	10 ppm	—	X
Phenyl mercaptan	108-98-5	0.5 ppm	1.5 ppm	—	—
Phenylphosphine	638-21-1	—	—	0.05 ppm	—
Phorate	298-02-2	0.05 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	—	X
Phosdrin (Mevinphos)	7786-34-7	0.01 ppm	0.03 ppm	—	X
Phosgene (carbonyl chloride)	75-44-5	0.1 ppm	0.3 ppm	—	—
Phosphine	7803-51-2	0.3 ppm	1 ppm	—	—
Phosphoric acid	7664-38-2	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Phosphorus (yellow)	7723-14-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Phosphorous oxychloride	10025-87-3	0.1 ppm	0.3 ppm	—	—
Phosphorus pentachloride	10026-13-8	0.1 ppm	0.3 ppm	—	—
Phosphorus pentasulfide	1314-80-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Phosphorus trichloride	12-2-19	0.2 ppm	0.5 ppm	—	—
Phthalic anhydride	85-44-9	1 ppm	3 ppm	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
m-Phthalodinitrile	626-17-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Picloram	1918-02-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Picric acid (2, 4, 6-Trinitrophenol)	88-89-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Pindone (2-Pivalyl-1, 3-indandione, Pival)	83-26-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Piperazine dihydrochloride	142-64-3	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pival (Pindone)	83-26-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Plaster of Paris	26499-65-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Platinum (as Pt)	7440-06-4	—	—	—	—
Metal	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Soluble salts	—	0.002 mg/m <sup>3</sup>	0.006 mg/m <sup>3</sup>	—	—
Polychlorobiphenyls (Chlorodiphenyls)	—	—	—	—	—
42% Chlorine (PCB)	53469-21-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
54% Chlorine (PCB)	11097-69-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Portland cement	65997-15-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Potassium hydroxide	1310-58-3	—	—	2 mg/m <sup>3</sup>	—
Propane	74-98-6	1,000 ppm	1,250 ppm	—	—
Propargyl alcohol	107-19-7	1 ppm	3 ppm	—	X
beta-Propiolactone (see WAC 296-62-073)	57-57-8	—	—	—	—
Propionic acid	79-09-4	10 ppm	20 ppm	—	—
Propoxur (Baygon)	114-26-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
n-Propyl acetate	109-60-4	200 ppm	250 ppm	—	—
n-Propyl alcohol	71-23-8	200 ppm	250 ppm	—	X
n-Propyl nitrate	627-13-4	25 ppm	40 ppm	—	—
Propylene	—	Simple asphyxiant		—	—
Propylene dichloride (1, 2-Dichloropropane)	78-87-5	75 ppm	110 ppm	—	—
Propylene glycol dinitrate	6423-43-4	0.05 ppm	0.15 ppm	—	X
Propylene glycol monomethyl ether	107-98-2	100 ppm	150 ppm	—	—
Propylene imine	75-55-8	2 ppm	4 ppm	—	X
Propylene oxide (1,2-Epoxypropane)	75-56-9	20 ppm	30 ppm	—	—
Propyne (Methyl acetylene)	74-99-7	1,000 ppm	1,250 ppm	—	—
Pyrethrum	8003-34-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pyridine	110-86-1	5 ppm	10 ppm	—	—
Pyrocatechol (Catechol)	120-80-9	5 ppm	10 ppm	—	X
Quinone (p-Benzoquinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
RDX (Cyclonite)	—	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Resorcinol	108-46-3	10 ppm	20 ppm	—	—
Rhodium (as Rh)	7440-16-6	—	—	—	—
Insoluble compounds, metal fumes and dusts	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Soluble compounds, salts	—	0.001 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>	—	—
Ronnel	299-84-3	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Rosin core solder, pyrolysis products (as formaldehyde)	8050-09-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Rotenone	83-79-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Rouge	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Rubber solvent (naphtha)	8030-30-6	100 ppm	150 ppm	—	—
Selenium compounds (as Se)	7782-49-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Selenium hexafluoride (as Se)	7783-79-1	0.05 ppm	0.15 ppm	—	—
Sesone (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sevin (Carbaryl)	63-25-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silane (see Silicon tetrahydride)	7803-62-5	5 ppm	10 ppm	—	—

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Silica, amorphous, precipitated and gel	112926-00-8	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica	61790-53-2	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Silica, crystalline cristobalite	—	—	—	—	—
Respirable fraction	14464-46-1	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Silica, crystalline quartz	—	—	—	—	—
Respirable fraction	14808-60-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silica, crystalline tripoli (as quartz)	—	—	—	—	—
Respirable fraction	1317-95-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silica, crystalline tridymite	—	—	—	—	—
Respirable fraction	15468-32-3	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Silica, fused	—	—	—	—	—
Respirable fraction	60676-86-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silicates (less than 1% crystalline silica)	—	—	—	—	—
Mica	—	—	—	—	—
Respirable fraction	12001-26-2	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Talc (containing asbestos) (see WAC 296-62-07705)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tremolite (see WAC 296-62-07705)	—	—	—	—	—
Silicon	7440-21-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silicon carbide	409-21-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silicon tetrahydride (Silane)	7803-62-5	5 ppm	10 ppm	—	—
Silver, metal dust and soluble compounds (as Ag)	7440-22-4	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Sodium azide (as HN <sub>3</sub> or NaN <sub>3</sub> )	26628-22-8	—	—	0.1 ppm	X
Sodium bisulfite	7631-90-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sodium-2, 4-dichloro-phenoxyethyl sulfate (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sodium fluoroacetate	62-74-8	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	X
Sodium hydroxide	1310-73-2	—	—	2 mg/m <sup>3</sup>	—
Sodium metabisulfite	7681-57-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Starch	9005-25-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Stibine	7803-52-3	0.1 ppm	0.3 ppm	—	—
Stoddard solvent	8052-41-3	100 ppm	150 ppm	—	—
Strychnine	57-24-9	0.15 mg/m <sup>3</sup>	0.45 mg/m <sup>3</sup>	—	—
Styrene (Phenylethylene, Vinyl benzene)	100-42-5	50 ppm	100 ppm	—	—
Subtilisins	9014-01-1	—	0.00006 mg/m <sup>3</sup> (60 min.)	—	—
Sucrose	57-50-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sulfotep (TEDP)	3689-24-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Sulfur dioxide	7446-09-5	2 ppm	5 ppm	—	—
Sulfur hexafluoride	2551-62-4	1,000 ppm	1,250 ppm	—	—
Sulfuric acid	7664-93-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Sulfur monochloride	10025-67-9	—	—	1 ppm	—
Sulfur pentafluoride	5714-22-1	—	—	0.01 ppm	—
Sulfur tetrafluoride	7783-60-0	—	—	0.1 ppm	—
Sulfuryl fluoride	2699-79-8	5 ppm	10 ppm	—	—
Sulprofos	35400-43-2	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Systox (Demeton)	8065-48-3	0.01 ppm	0.03 ppm	—	X
2, 4, 5-T	93-76-5	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Talc (containing asbestos) (see WAC 296-62-07705)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tantalum	—	—	—	—	—
Metal and oxide dusts	7440-25-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
TDI (Toluene-2, 4-diisocyanate)	584-84-9	0.005 ppm	0.02 ppm	—	—
TEDP (Sulfotep)	3689-24-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Tellurium and compounds (as Te)	13494-80-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Tellurium hexafluoride (as Te)	7783-80-4	0.02 ppm	0.06 ppm	—	—
Temephos (Abate)	3383-96-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
TEPP	107-49-3	0.004 ppm	0.012 ppm	—	X
Terphenyls	26140-60-3	—	—	0.5 ppm	—
1, 1, 1, 2-Tetrachloro-2, 2-difluoroethane	76-11-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloro-1, 2-difluoroethane	76-12-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloroethane	79-34-5	1 ppm	3 ppm	—	X
Tetrachloroethylene (Perchloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Tetrachloromethane (Carbon tetrachloride)	56-23-5	2 ppm	4 ppm	—	X
Tetrachloronaphthalene	1335-88-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	X
Tetraethyl lead (as Pb)	78-00-2	0.075 mg/m <sup>3</sup>	0.225 mg/m <sup>3</sup>	—	X
Tetrahydrofuran	109-99-9	200 ppm	250 ppm	—	—
Tetramethyl lead (as Pb)	75-74-1	0.075 mg/m <sup>3</sup>	0.225 mg/m <sup>3</sup>	—	X
Tetramethyl succinonitrile	3333-52-6	0.5 ppm	1.5 ppm	—	X
Tetranitromethane	509-14-8	1 ppm	3 ppm	—	—
Tetrasodium pyrophosphate	7722-88-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Tetryl (2, 4, 6-trinitrophenyl- methylnitramine)	479-45-8	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Thallium (soluble compounds) (as Tl)	7440-28-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
4, 4-Thiobis (6-tert-butyl-m-cresol)	96-69-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Thiodan (Endosulfan)	115-29-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Thioglycolic acid	68-11-1	1 ppm	3 ppm	—	X
Thionyl chloride	7719-09-7	—	—	1 ppm	—
Thiram (see WAC 296-62-07519)	137-26-8	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Tin (as Sn)	—	—	—	—	—
Inorganic compounds	7440-31-5	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tin (as Sn)	—	—	—	—	—
Organic compounds	7440-31-5	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Tin oxide (as Sn)	21651-19-4	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Titanium dioxide	13463-67-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
TNT (2, 4, 6-Trinitrotoluene)	118-96-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Toluene	108-88-3	100 ppm	150 ppm	—	—
Toluene-2, 4-diisocyanate (TDI)	584-84-9	0.005 ppm	0.02 ppm	—	—
m-Toluidine	108-44-1	2 ppm	4 ppm	—	X
o-Toluidine	95-53-4	2 ppm	4 ppm	—	X
p-Toluidine	106-49-0	2.0 ppm	4 ppm	—	X
Toxaphene (Chlorinated camphene)	8001-35-2	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	—	X

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Tremolite (see WAC 296-62-07705)	—	—	—	—	—
Tributyl phosphate	126-73-8	0.2 ppm	0.6 ppm	—	—
Trichloroacetic acid	76-03-9	1 ppm	3 ppm	—	—
1, 2, 4-Trichlorobenzene	120-82-1	—	—	5 ppm	—
1, 1, 1-Trichloroethane (Methyl chloroform)	71-55-6	350 ppm	450 ppm	—	—
1, 1, 2-Trichloroethane	79-00-5	10 ppm	20 ppm	—	—
Trichloroethylene	79-01-6	50 ppm	200 ppm	—	—
Trichlorofluoromethane (Fluorotrichloromethane)	75-69-4	—	—	1,000 ppm	—
Trichloromethane (Chloroform)	67-66-3	2 ppm	4 ppm	—	—
Trichloronaphthalene	1321-65-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
1, 2, 3-Trichloropropane	96-18-4	10 ppm	20 ppm	—	X
1, 1, 2-Trichloro-1, 2, 2-trifluoroethane	76-13-1	1,000 ppm	1,250 ppm	—	—
Tricyclohexyltin hydroxide (Cyhexatin)	13121-70-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Triethylamine	121-44-8	10 ppm	15 ppm	—	—
Trifluorobromomethane	75-63-8	1,000 ppm	1,250 ppm	—	—
Trimellitic anhydride	552-30-7	0.005 ppm	0.015 ppm	—	—
Trimethylamine	75-50-3	10 ppm	15 ppm	—	—
Trimethyl benzene	25551-13-7	25 ppm	38 ppm	—	—
Trimethyl phosphite	121-45-9	2 ppm	4 ppm	—	—
2, 4, 6-Trinitrophenol (Picric acid)	88-89-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
2, 4, 6-Trinitrophenyl-methylnitramine (Tetryl)	479-45-8	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
2, 4, 6-Trinitrotoluene (TNT)	118-96-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Triorthocresyl phosphate	78-30-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Triphenyl amine	603-34-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Triphenyl phosphate	115-86-6	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Tungsten (as W)	7440-33-7	—	—	—	—
Soluble compounds	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Turpentine	8006-64-2	100 ppm	150 ppm	—	—
Uranium (as U)	7440-61-1	—	—	—	—
Soluble compounds	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
n-Valeraldehyde	110-62-3	50 ppm	75 ppm	—	—
Vanadium (as V2O5)	—	—	—	—	—
Respirable fraction	1314-62-1	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Vegetable oil mist	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Vinyl acetate	108-05-1	10 ppm	20 ppm	—	—
Vinyl benzene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Vinyl bromide	593-60-2	5 ppm	10 ppm	—	—
Vinyl chloride (Chloroethylene) (see WAC 296-62-07329)	75-01-4	1 ppm	5 ppm	—	—
Vinyl cyanide (Acrylonitrile) (see WAC 296-62-07336)	107-13-1	2 ppm	10 ppm	—	—
Vinyl cyclohexene dioxide	106-87-6	10 ppm	20 ppm	—	X
Vinyl toluene	25013-15-4	50 ppm	75 ppm	—	—
Vinylidene chloride (1, 1-Dichloroethylene)	75-35-4	1 ppm	3 ppm	—	—
VM & P Naphtha	8032-32-4	300 ppm	400 ppm	—	—
Warfarin	81-81-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Welding fumes (total particulate)	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Wood dust	—	—	—	—	—
Nonallergenic; (All woods except allergenics)	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Allergenics (e.g. cedar, mahogany and teak)	—	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Xylenes (ortho, meta, and para isomers) (Dimethylbenzene)	1330-20-7	100 ppm	150 ppm	—	—
m-Xylene alpha, alpha-diamine	1477-55-0	—	—	0.1 mg/m <sup>3</sup>	X
Xylidine (Dimethylaminobenzene)	1300-73-8	2 ppm	4 ppm	—	X

**Table 3 "Permissible Exposure Limits for Air Contaminants"**

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Yttrium	7440-65-5	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Zinc chloride fume	7646-85-7	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	—	—
Zinc chromate (as CrO <sub>3</sub> )	Varies with compound	0.05 mg/m <sup>3</sup>	—	0.1 mg/m <sup>3</sup>	—
Zinc oxide	1314-13-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zinc oxide fume	1314-13-2	5 mg/g <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zinc stearate	557-05-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zirconium compounds (as Zr)	7440-67-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 04-18-079, § 296-841-20025, filed 8/31/04, effective 11/1/04.]

### WAC 296-841-300 Definitions.

#### Breathing zone

The space around and in front of an employee's nose and mouth, forming a hemisphere with a six to nine inch radius.

#### Ceiling

An exposure limit, measured over the shortest time period feasible, that must not be exceeded during any part of the employee's workday.

#### Dust

Solid particles suspended in air. Dusts are generated by handling, drilling, crushing, grinding, rapid impact, detonation, or decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, grain, etc.

#### Exposed or exposure

The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

#### Fume

Solid particles suspended in air, generated by condensation from the gaseous state, generally after volatilization from molten metals, etc.

#### Gas

A normally formless fluid which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.

#### Mist

Liquid droplets suspended in air, generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming, spraying or atomizing.

#### Oxygen deficient

An atmosphere with an oxygen content below 19.5% by volume.

#### Permissible exposure limits (PEL)

Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA rules.

#### Short-term exposure limit (STEL)

An exposure limit averaged over a short time period (usually measured for fifteen minutes) that must not be exceeded during any part of an employee's workday.

296-842-200 Air quality for self-contained breathing apparatus

#### Time weighted average (TWA<sub>8</sub>)

An exposure limit averaged over eight hours that must not be exceeded during an employee's workday.

#### Toxic substance

Any chemical substance or biological agent, such as bacteria, virus, and fungus, which is any of the following:

- Listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS)
- Shows positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer.
- The subject of a material safety data sheet kept by or known to the employer showing the material may pose a hazard to human health.

#### Vapor

The gaseous form of a substance that is normally in the solid or liquid state.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 04-18-079, § 296-841-300, filed 8/31/04, effective 11/1/04; 03-20-115, § 296-841-300, filed 10/1/03, effective 1/1/04.]

## Chapter 296-842 WAC

### RESPIRATORS

#### WAC

296-842-100	Scope.
296-842-105	Respirator program administrator.
296-842-10505	Designate a program administrator.
296-842-110	Voluntary respirator use requirements.
296-842-11005	Make sure voluntary use of respirators is safe.
296-842-11010	Keep voluntary use program records.
296-842-120	Written respirator program and recordkeeping.
296-842-12005	Develop and maintain a written program.
296-842-12010	Keep respirator program records.
296-842-130	Respirator selection.
296-842-13005	Select and provide appropriate respirators.
296-842-140	Medical evaluations.
296-842-14005	Provide medical evaluations.
296-842-150	Fit testing.
296-842-15005	Conduct fit testing.
296-842-160	Training.
296-842-16005	Provide effective training.
296-842-170	Maintenance.
296-842-17005	Maintain respirators in a clean and reliable condition.
296-842-17010	Store respirators properly.
296-842-17015	Inspect and repair respirators.
296-842-180	Safe use and removal of respirators.
296-842-18005	Prevent sealing problems with tight-fitting respirators.
296-842-18010	Make sure employees leave the use area before removing respirators.
296-842-190	Standby requirements for immediately dangerous to life or health (IDLH) conditions.
296-842-19005	Provide standby assistance in immediately dangerous to life or health (IDLH) conditions. (SCBA) and air-line respirators.

296-842-20005	Make sure breathing air and oxygen meet established specifications.
296-842-20010	Prevent conditions that could create a hazardous breathing air supply.
296-842-20015	Make sure compressors do not create a hazardous breathing air supply.
296-842-210	Labeling of air-purifying respirator filters, cartridges, and canisters.
296-842-21005	Keep labels readable on respirator filters, cartridges, and canisters during use.
296-842-220	Required procedures for respiratory protection program.
296-842-22005	Use this medical questionnaire for medical evaluations.
296-842-22010	Follow these fit-testing procedures for tight-fitting respirators.
296-842-22015	Follow procedures established for cleaning and disinfecting respirators.
296-842-22020	Follow procedures established for seal checking respirators.
296-842-300	Definitions.

**WAC 296-842-100 Scope.** This chapter applies to all use of respirators at work.

**IMPORTANT:**

Before you decide to use respirators, you are required to evaluate respiratory hazards and implement control methods as outlined in chapter 296-841 WAC, Respiratory hazards.

The term "respiratory hazards" will be used throughout this chapter to refer to oxygen deficient conditions and harmful airborne hazards.

**Definition:**

Respirators are a type of personal protective equipment designed to protect the wearer from respiratory hazards.

You can use Table 1 for general guidance on which chapter sections apply to you.

**Table 1**  
**Chapter sections that apply to your workplace**

If employees...	Then the sections marked with an "X" apply...					
	105	110	120	130-210	220	300
Request and are <b>permitted</b> to voluntarily use filtering-face-piece respirators, and are not exposed to a respiratory hazard		X				X
Request and are <b>permitted</b> to voluntarily use respirators that are <b>NOT</b> filtering-facepiece respirators, and are not exposed to a respiratory hazard	X	X			X	X
Are <b>required</b> to use any respirator by WISHA or the employer	X		X	X	X	X
Would use an <b>escape respirator</b> in an emergency	X		X	X	X	X

**Reference:** See WAC 296-800-160, Personal protective equipment (PPE) to find requirements for other types of personal protective equipment (PPE), such as eye, hand, and head protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-100, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-105 Respirator program administrator.**

**Your responsibility:**

To make sure a capable individual is in charge of respirator program development and management.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-105, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-10505 Designate a program administrator.**

**Exemption:** You do not need to designate a program administrator if employees use only filtering-facepiece respirators and do so only as voluntary use.

**Definition:**

Voluntary use is respirator use that is requested by the employee AND permitted by the employer when **NO** respiratory hazard exists.

**You must:**

- Designate a program administrator who has overall responsibility for your program and has sufficient training or experience to:
  - Oversee program development and coordinate implementation
  - Conduct required evaluations of program effectiveness outlined in WAC 296-842-12005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-10505, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-110 Voluntary respirator use requirements.**

**Your responsibility:**

[Title 296 WAC—p. 2948]

To make sure voluntary use of respirators by employees does not create job safety or health hazards.

**You must:**

Make sure voluntary use of respirators is safe  
WAC 296-842-11005

Keep voluntary use respirator program records  
WAC 296-842-11010.

**IMPORTANT:**

- Respirator use is **NOT** voluntary if a respiratory hazard, such as exposure to a substance over the permissible exposure limit (PEL) or hazardous exposure to an airborne biological hazard, is present.

- To evaluate respiratory hazards in your workplace, see chapter 296-841 WAC, Respiratory hazards.

- Some requirements in this section do not apply if only filtering-facepiece respirators are used voluntarily. Some filtering-facepiece respirators are equipped with a sorbent layer for absorbing "nuisance" organic vapors. These can be used for voluntary use, but are not NIOSH certified for protection against hazardous concentrations of organic vapor.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-110, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-11005 Make sure voluntary use of respirators is safe.**

**Definition:**

Voluntary use is respirator use that is requested by the employee AND permitted by the employer when **NO** respiratory hazard exists.

**IMPORTANT:** If you choose to require respirator use, use is NOT voluntary and the required use sections of this chapter apply.

**You must:**

(1) Make sure voluntary respirator use does NOT:

- Interfere with an employee's ability to work safely, such as restricting necessary vision or radio communication

**OR**

- Create health hazards.

**Note:** Examples of health hazards include:

- Skin irritation, dermatitis, or other health effects caused by using a dirty respirator
- Illness created by sharing contaminated respirators
- Health effects caused by use of an unsafe air supply, such as carbon monoxide poisoning.

**You must:**

(2) Provide all voluntary respirator users with the advisory information in Table 2 at no cost to them.

**Note:** If you have provided employees with the advisory information required in the previous rule, WAC 296-62-07117, you do not need to provide the additional information in Table 2 to those employees.

**You must:**

(3) Develop and maintain a written program that includes the following:

**Exemption:** If employees use only filtering-facepiece respirators and do so only voluntarily, you do not need to develop and maintain a written program.

- Medical evaluation provisions as specified in WAC 296-842-140.

- Procedures to properly clean and disinfect respirators, according to WAC 296-842-22015, if they are reused.

- How to properly store respirators, according to WAC 296-842-17010, so that using them does not create hazards.

- Procedures to make sure there is a safe air supply, according to WAC 296-842-200, when using air-line respirators and SCBAs.

- Training according to WAC 296-842-160 when necessary to ensure respirator use does NOT create a hazard.

**Note:**

- Pay for medical evaluations, training, travel related costs, and wages. You do NOT need to pay for respirators employees use only voluntarily.
- If you have both voluntary and required respirator users, you may choose to treat voluntary users as required users. Doing this exceeds the requirements in this section.

Use Table 2 to provide information to employees who voluntarily use any type of respirator.

**Table 2**

**Advisory Information for Employees Who Voluntarily Use Respirators**

- Respirators protect against airborne hazards when properly selected and used. WISHA recommends voluntary use of respirators when exposure to substances is below WISHA permissible exposure limits (PELs) because respirators can provide you an additional level of comfort and protection.
- If you choose to voluntarily use a respirator (whether it is provided by you or your employer) be aware that **respirators can create hazards for you**, the user. You can avoid these hazards if you know how to use your respirator properly AND how to keep it clean. Take these steps:
  - Read and follow all instructions provided by the manufacturer about use, maintenance (cleaning and care), and warnings regarding the respirator's limitations.
  - Choose respirators that have been certified for use to protect against the substance of concern. The National Institute for Occupational Safety and Health (NIOSH) certifies respirators. If a respirator is not certified by NIOSH, you have no guarantee that it meets minimum design and performance standards for workplace use.
    - A NIOSH approval label will appear on or in the respirator packaging. It will tell you what protection the respirator provides.
  - Keep track of your respirator so you do not mistakenly use someone else's.
  - **DO NOT** wear your respirator into:
    - Atmospheres containing hazards that your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against solvent vapor, smoke or oxygen deficiency.
    - Situations where respirator use is required.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-11005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-11010 Keep voluntary use program records.**

**Exemption:** If employees use only filtering-facepiece respirators voluntarily, you do not need to follow these record-keeping requirements.

**You must:**

- Keep copies of:
  - Your current written respirator program
  - Written recommendations from the LHCP
- Allow records required by this section to be examined and copied by affected employees and their representatives.

**Reference:** See chapter 296-62 WAC, Part B, Access to records for additional requirements that apply to medical records.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-11010, filed 10/1/03, effective 1/1/04.]

(2007 Ed.)

**WAC 296-842-120 Written respirator program and recordkeeping.**

**Your responsibility:**

To develop, implement, and maintain a written program that provides clear instruction for safe and reliable respirator use.

**You must:**

Develop and maintain a written program

WAC 296-842-12005

Keep respirator program records

WAC 296-842-12010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-120, filed 10/1/03, effective 1/1/04.]

[Title 296 WAC—p. 2949]

**WAC 296-842-12005 Develop and maintain a written program.**

**Exemption:** This section does NOT apply to respirator use that is voluntary. See WAC 296-842-11005 for voluntary use program requirements.

**You must:**

(1) Develop a complete worksite-specific written respiratory protection program that includes the applicable elements listed in Table 3.

**Note:** Pay for respirators, medical evaluations, fit testing, training, maintenance, travel costs, and wages.

**You must:**

(2) Keep your program current and effective by evaluating it and making corrections. Do ALL of the following:

- Make sure procedures and program specifications are followed and appropriate.
- Make sure selected respirators continue to be effective in protecting employees. For example:

– If changes in work area conditions, level of employee exposure, or employee physical stress have occurred, you need to reevaluate your respirator selection.

- Have supervisors periodically monitor employee respirator use to make sure employees are using them properly.

- Regularly ask employees required to use respirators about their views concerning program effectiveness and whether they have problems with:

- Respirator fit during use
- Any effects of respirator use on work performance
- Respirators being appropriate for the hazards encountered
- Proper use under current worksite conditions
- Proper maintenance.

When developing your written program include applicable elements listed in Table 3.

**Table 3**

<b>Required Elements for Required-Use Respirator Programs</b>	
• Selection:	<ul style="list-style-type: none"> <li>– Procedures for respirator selection</li> <li>– A list specifying the appropriate respirator for each respiratory hazard in your workplace</li> <li>– Procedures for issuing the proper type of respirator, if appropriate</li> </ul>
• Medical evaluation provisions	
• Fit-test provisions and procedures, if tight-fitting respirators are selected	
• Training provisions that address:	<ul style="list-style-type: none"> <li>– Respiratory hazards encountered during:                             <ul style="list-style-type: none"> <li>■ Routine activities</li> <li>■ Infrequent activities, for example, bimonthly cleaning of equipment</li> <li>■ Reasonably foreseeable emergencies, for example, rescue, spill response, or escape situations</li> </ul> </li> <li>– Proper use of respirators, for example, how to put on or remove respirators, and use limitations.</li> </ul>
<b>Note:</b>	You do NOT need to repeat training on respiratory hazards if employees have been trained on this in compliance with other rules such as WAC 296-800-170, employer chemical hazard communication in the WISHA safety and health core rules.
• Respirator use procedures for:	<ul style="list-style-type: none"> <li>– Routine activities</li> <li>– Infrequent activities</li> <li>– Reasonably foreseeable emergencies</li> </ul>
• Maintenance:	<ul style="list-style-type: none"> <li>– Procedures and schedules for respirator maintenance covering:                             <ul style="list-style-type: none"> <li>■ Cleaning and disinfecting</li> <li>■ Storage</li> <li>■ Inspection and repair</li> <li>■ When to discard respirators</li> </ul> </li> <li>– A cartridge or canister change schedule <b>IF</b> air-purifying respirators are selected for use against gas or vapor contaminants <b>AND</b> an end-of-service-life-indicator (ESLI) is not available. In addition, provide:                             <ul style="list-style-type: none"> <li>■ The data and other information you relied on to calculate change schedule values (for example, highest contaminant concentration estimates, duration of employee respirator use, expected maximum humidity levels, user breathing rates, and safety factors)</li> </ul> </li> </ul>
• Procedures to ensure a safe air quantity and quality <b>IF</b> atmosphere-supplying respirators (air-line or SCBA) are selected	
• Procedures for evaluating program effectiveness on a regular basis	

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-12005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-12010 Keep respirator program records.**

**You must:**

- Keep the following records:
  - Your current respirator program
    - Description (type, manufacturer, model, style, and

– Each employee's current fit test record, if fit testing is conducted. Fit test records must include:

- Employee name
- Test date
- Type of fit-test performed (size) of the respirator tested

■ Results of fit tests, for example, for quantitative fit tests include the overall fit factor AND a print out, or other recording of the test.

- Training records that include employee's names and the dates trained
- Written recommendations from the LHCP.
- Allow records required by this section to be examined and copied by affected employees and their representatives.

**Reference:** See chapter 296-62 WAC, Part B, Access to records, for additional requirements that apply to medical records.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-12010, filed 10/1/03, effective 1/1/04.]

### WAC 296-842-130 Respirator selection.

#### Your responsibility:

To select and provide respirators that are appropriate for the hazard, user, and worksite conditions.

**Exemption:** This section does NOT apply to voluntary respirator use. See WAC 296-842-110 of this chapter for voluntary use program requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-130, filed 10/1/03, effective 1/1/04.]

### WAC 296-842-13005 Select and provide appropriate respirators.

#### IMPORTANT:

See chapter 296-841, Respiratory hazards, for:

- Hazard evaluation requirements. Evaluation results are necessary for respirator selection.
- A list of substance-specific rules that may also apply to you. Those listed rules have additional respirator selection requirements.

#### You must:

- Select and provide, at no cost to employees, appropriate respirators for routine use, infrequent use, and reasonably foreseeable emergencies (such as escape, emergency, and spill response situations) by completing the following process:

#### Respirator Selection Process

**Step 1:** If your only respirator use is for escape, skip to **Step 9** to select appropriate respirators.

**Step 2:** If the respiratory hazard is a biological aerosol, such as TB (tuberculosis), anthrax, psittacosis (parrot fever), or hanta virus, select a respirator appropriate for **nonemergency** activities recognized to present a health risk to workers AND skip to **Step 9**.

• If respirator use will occur during **emergencies**, skip to **Step 9** and document the analysis used to select the appropriate respirator.

• Use Centers for Disease Control (CDC) selection guidance for exposures to specific biological agents when this guidance exists. Visit <http://www.cdc.gov>.

**Step 3:** If the respiratory hazard is a pesticide, follow the respirator specification on the pesticide label AND skip to **Step 10**.

**Step 4:** Determine the expected exposure concentration for each respiratory hazard of concern. Use the results from the evaluation required by chapter 296-841 WAC, Respiratory hazards.

**Step 5:** Determine if the respiratory hazard is classified as IDLH; if it is NOT IDLH skip to **Step 8**.

(2007 Ed.)

- The respiratory hazard IS classified as IDLH if:
  - The atmosphere is oxygen deficient or oxygen enriched

#### OR

- You CANNOT measure or estimate your expected exposure concentration

#### OR

- Your measured or estimated expected exposure concentration is greater or equal to the IDLH value in the NIOSH *Pocket Guide to Chemical Hazards*

**Note:** • WISHA uses the IDLH values in the 1990 edition of the NIOSH *Pocket Guide to Hazardous Chemicals* to determine the existence of IDLH conditions. You may use more recent editions of this guide. Visit [www.cdc.gov/niosh](http://www.cdc.gov/niosh) for more information.

• If your measured or estimated expected exposure concentration is below NIOSH's IDLH values, proceed to **Step 8**.

**Step 6:** Select an appropriate respirator from one of the following respirators for IDLH conditions and skip to **Step 9**:

- Full-facepiece, pressure demand, self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes

#### OR

- Full-facepiece, pressure demand air-line respirator equipped with an auxiliary self-contained air supply

**Exception:** If the respiratory hazard is oxygen deficiency AND you can show oxygen concentrations can be controlled within the ranges listed in Table 4 under ALL foreseeable conditions, you are allowed to select ANY type of SCBA or air-line respirator:

**Table 4**  
**Concentration Ranges for Oxygen Deficiency**

Altitude (as ft. above sea level)	Oxygen Concentration Range (as percent oxygen)
Below 3,001	16.0 - 19.5
3,001 - 4,000	16.4 - 19.5
4,001 - 5,000	17.1 - 19.5
5,001 - 6,000	17.8 - 19.5
6,001 - 8,000	19.3 - 19.5
Above 8,000 feet the exception does not apply.	

**Step 8:** Identify respirator types with assigned protection factors (APFs) from Table 5 that are appropriate to protect employees from the expected exposure concentration.

**Step 9:** Consider hazards that could require selection of specific respirator types. For example, select full-facepiece respirators to prevent eye irritation or abrasive blasting helmets to provide particle rebound protection.

**Step 10:** Evaluate user and workplace factors that might compromise respirator performance, reliability or safety.

- If the respiratory hazard is a pesticide, follow the requirements on the pesticide label and skip to **Step 12**.

Examples:

- High humidity or temperature extremes in the workplace.

- Necessary voice communication.

- High traffic areas and moving machinery.

- Time or distance for escape.

**Step 11:** Follow Table 6 requirements to select an air-purifying respirator.

- If Table 6 requirements cannot be met, you must select an air-line respirator or an SCBA.

**Step 12:** Make sure respirators you select are certified by the National Institute for Occupational Safety and Health (NIOSH).

- To maintain certification, make sure the respirator is used according to cautions and limitations specified on the NIOSH approval label.

**Note:** While selecting respirators, you will need to select a sufficient number of types, models or sizes to provide for fit testing. You can also consider other respirator use issues, such as accommodating facial hair with a loose fitting respirator.

Use Table 5 to identify the assigned protection factor for different types of respirators.

**Table 5**  
**Assigned Protection Factors (APF) for Respirator Types**

If the respirator is a(n) . . .	Then the APF is . . .
Air-purifying respirator with a: <ul style="list-style-type: none"> <li>Half-facepiece . . . . .</li> <li>Full-facepiece . . . . .</li> </ul> <b>Note:</b> Half-facepiece includes 1/4 masks, filtering facepieces, and elastomeric facepieces.	10 100
Powered air-purifying respirator (PAPR) with a: <ul style="list-style-type: none"> <li>Loose-fitting facepiece . . . . .</li> <li>Half-facepiece . . . . .</li> <li>Full-facepiece, equipped with HEPA filters, chemical cartridges or canisters . . . . .</li> <li>Hood or helmet, equipped with HEPA filters, chemical cartridges or canisters . . . . .</li> </ul>	25 50 1000 1000
Air-line respirator with a: <ul style="list-style-type: none"> <li>Half-facepiece and designed to operate in demand mode . . . . .</li> <li>Loose-fitting facepiece and designed to operate in continuous flow mode . . . . .</li> <li>Half-facepiece and designed to operate in continuous-flow, or pressure-demand mode . . . . .</li> <li>Full-facepiece and designed to operate in demand mode . . . . .</li> <li>Full-facepiece and designed to operate in continuous-flow OR pressure-demand mode . . . . .</li> <li>Helmet or hood and designed to operate in continuous-flow mode . . . . .</li> </ul>	10 25 50 100 1000 1000
Self-contained breathing apparatus (SCBA) with a tight fitting: <ul style="list-style-type: none"> <li>Half-facepiece and designed to operate in demand mode . . . . .</li> <li>Full-facepiece and designed to operate in demand mode . . . . .</li> <li>Full-facepiece and designed to operate in pressure-demand mode . . . . .</li> </ul> Combination respirators: <ul style="list-style-type: none"> <li>Find the APF for each type of respirator in the combination.</li> </ul>	10 100 10,000 The lowest value

If the respirator is a(n) . . .	Then the APF is . . .
• Use the lower APF to represent the combination.	

Use Table 6 to select air-purifying respirators for particle, vapor, or gas contaminants.

**Table 6**  
**Requirements for Selecting Any Air-purifying Respirator**

If the contaminant is a . . .	Then . . .
• Gas OR vapor	<ul style="list-style-type: none"> <li>Provide a respirator with canisters or cartridges equipped with a NIOSH-certified, end-of-service-life indicator (ESLI)</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>If a canister or cartridge with an ESLI is NOT available, develop a cartridge change schedule to make sure the canisters or cartridges are replaced before they are no longer effective</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>Select an atmosphere-supplying respirator</li> </ul>
• Particle, such as a dust, spray, mist, fog, fume, or aerosol	<ul style="list-style-type: none"> <li>Select respirators with filters certified to be at least 95% efficient by NIOSH                             <ul style="list-style-type: none"> <li>For example, N95s, R99s, P100s, or High Efficiency Particulate Air filters (HEPA)</li> </ul> </li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>You may select respirators NIOSH certified as "dust and mist," "dust, fume, or mist," OR "pesticides." You can only use these respirators if particles primarily have a mass median aerodynamic diameter of at least two micrometers.</li> </ul> <b>Note:</b> These respirators are no longer sold for occupational use.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-13005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-140 Medical evaluations.**

**Your responsibility:**

To make sure a respirator used under your specific work-site conditions is not a health risk to employees.

**Exemption:** This section does NOT apply to employees who only use:
 

- Filtering-facepiece respirators voluntarily. See WAC 296-842-110 of this chapter for voluntary use requirements

**OR**

- Escape-only respirators that are mouthpiece, loose-fitting, or hooded respirators.

**IMPORTANT:**

- Using a respirator can create physical risks for an employee each time it is worn. The extent of these risks depends on these factors:

- Type of respirator
- Environmental conditions at the worksite
- Physical demands of the work
- Use of other protective clothing
- Employee's health status.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-140, filed 10/1/03, effective 1/1/04.]

### WAC 296-842-14005 Provide medical evaluations.

#### IMPORTANT:

If you have provided an employee with a medical evaluation addressing respirator use, as required by another chapter, that evaluation will meet the requirements of this section.

You must:

- Follow the medical evaluation process, Steps 1 through 7 in this section, to provide medical evaluations for employees at no cost to them.

#### Medical Evaluation Process

**Step 1:** Identify employees who need medical evaluations AND determine the frequency of evaluations from Table 7. Include employees who:

- Are required to use respirators

OR

- Voluntarily use respirators that are **not** filtering-face-piece respirators

**Note:** You may use a previous employer's medical evaluation for an employee if you can:

- Show the employee's previous work and use conditions were substantially similar to yours

AND

- Obtain a copy of the licensed health care professional's (LHCP's) written recommendation approving the employee's use of the respirator chosen by you.

**Step 2:** Identify a licensed health care professional (LHCP) to perform your medical evaluations.

**Note:** If you select a different LHCP, you do not need to have new medical evaluations done.

**Step 3:** Make sure your LHCP has the following information **before** the evaluation is completed:

- Information describing the respirators employees may use, including the weight and type.
  - How the respirators will be used, including:
    - How often the respirator will be used, for example, daily, or once a month
    - The duration of respirator use, for example, a minimum of one hour, or up to twelve hours
    - The employee's expected physical work effort
    - Additional personal protective clothing and equipment to be worn
    - Temperature and humidity extremes expected during use
- A copy of your written respiratory protection program **and** this chapter.

**Note:**

- You may choose to send the questionnaire to the LHCP ahead of time, giving time to review it and add any necessary questions
- The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

**Step 4:** Administer the medical questionnaire in WAC 296-842-22005 to employees, OR provide them a medical exam that obtains the same information.

**Note:** You may use on-line questionnaires if the questions are the same and requirements of this section are met.

• Administer the examination or questionnaire at no cost to employees:

- During the employee's normal working hours

OR

- At a time and place convenient to the employee

• Maintain employee confidentiality during examination or questionnaire administration:

- Do **not** view employee's answers on the questionnaire
- Do **not** act in a manner that may be considered a breach of confidentiality

**Note:** Providing confidentiality is important for securing successful medical evaluations. It helps make sure the LHCP gets complete and dependable answers on the questionnaire.

• Make sure employees understand the content of the questionnaire.

• Provide the employee with an opportunity to discuss the questionnaire or exam results with the LHCP.

**Step 5:** Provide follow-up evaluation for employees when:

- The LHCP needs more information to make a final recommendation

OR

• An employee gives any positive response to questions 1-8 in Part 2 OR to questions 1-6 in Part 3 of the WISHA medical evaluation questionnaire in WAC 296-842-22005.

**Note:** Follow-up may include:

- Employee consultation with the LHCP such as a telephone conversation to evaluate positive questionnaire responses
- Medical exams
- Medical tests or other diagnostic procedures.

**Step 6:** Obtain a written recommendation from the LHCP that contains only the following medical information:

- Whether or not the employee is medically able to use the respirator
- Any limitations of respirator use for the employee
- What future medical evaluations, if any, are needed
- A statement that the employee has been provided a copy of the written recommendation.

**Step 7:** Provide a powered, air-purifying respirator (PAPR) when the LHCP determines the employee should not wear a negative-pressure air-purifying respirator **AND** is able to wear a PAPR.

**Reference:** See WAC 296-842-130 for requirements regarding selection of air-purifying respirators.

**Note:**

- You may discontinue medical evaluations for an employee when the employee no longer uses a respirator.
- If you have staff conducting your medical evaluations, they may keep completed questionnaires and findings as confidential medical records, if they are maintained separately from other records.

Use Table 7 to determine medical evaluation frequency.

**Table 7**  
**Evaluation Frequency**

<b>Type of Evaluation:</b>	<b>When required:</b>
Initial medical evaluations	<ul style="list-style-type: none"> <li>• Before respirators are fit-tested or used in the workplace.</li> </ul>
Subsequent medical evaluations	<ul style="list-style-type: none"> <li>• If any of these occur:               <ul style="list-style-type: none"> <li>– Your licensed health care professional (LHCP) recommends them; for example, periodic evaluations at specified intervals.</li> <li>– A respirator program administrator or supervisor informs you that an employee needs reevaluation.</li> <li>– Medical signs or symptoms (such as breathing difficulties) are:                   <ul style="list-style-type: none"> <li>■ Observed during fit testing or program evaluation</li> </ul> </li> <li align="center"><b>OR</b></li> <li>■ Reported by the employee</li> </ul> </li> <li>– Changes in worksite conditions such as physical work effort, personal protective clothing, or temperature that could substantially increase the employee's physiological stress.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-14005, filed 10/1/03, effective 1/1/04.]

### **WAC 296-842-150 Fit testing.**

#### **Your responsibility:**

To make sure negative and positive-pressure tight-fitting respirators can provide an adequate fit and acceptable level of comfort to employees.

**Exemption:** This section does NOT apply to any respirators that are:

- Voluntarily used. See WAC 296-842-110 for voluntary use requirements.
- Mouthpiece respirators.

#### **IMPORTANT:**

- Fit testing is an activity where the seal of a respirator is tested to determine if it is adequate.
- This section covers general **requirements** for fit testing. Fit testing **procedures** are covered in WAC 296-842-22010 of this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-150, filed 10/1/03, effective 1/1/04.]

### **WAC 296-842-15005 Conduct fit testing.**

#### **You must:**

- Provide, at no cost to the employee, fit tests for ALL tight fitting respirators on the following schedule:
  - Before employees are assigned duties that may require the use of respirators
  - At least every twelve months after initial testing
  - Whenever any of the following occurs:
    - A different respirator facepiece is chosen such as a different type, model, style, or size
    - You become aware of a physical change in an employee that could affect respirator fit. For example, you may observe, or be told about, facial scarring, dental changes, cosmetic surgery, or obvious weight changes
    - An employee notifies you, or your LHCP, that the respirator fit is unacceptable. During the retest, you must give an employee reasonable opportunity to select a different respirator facepiece (size, model, etc.).

**Note:** You may accept a fit test completed by a previous employer **IF:**

- You obtain written documentation of the fit test

**AND**

- The results of the fit test are not more than twelve months old

**AND**

- The employee will use the same respirator (the same type, model, style, and size)

**AND**

- The fit test was conducted in a way that meets the requirements of WAC 296-842-150 and 296-842-22010.

#### **You must:**

- Select an appropriate fit-testing procedure from WAC 296-842-22010 of this chapter **AND:**

- Use quantitative fit-test methods when a negative pressure respirator will be used in concentrations requiring a protection factor greater than 10. This includes:

- Full facepiece air-purifying respirators
- SCBAs operated in demand (negative pressure) mode
- Air-line respirators operated in demand mode.

- Make sure PAPRs, SCBAs, or air-line respirators are fit tested in negative-pressure mode.

- Make sure the person conducting fit testing is able to do ALL of the following:

- Prepare test solutions if required
- Make sure equipment works properly
- Perform tests properly
- Recognize invalid tests
- Calculate fit factors properly if required.

**Note:**

- No specific training program or certification is required for those who conduct fit tests.
- You should consider evaluating these individuals to determine their proficiency in the fit-testing method to be used.
- You can use an evaluation form such as the form included in the American National Standard for Respirator Fit Testing Methods, ANSI/AIHA Z88.10-2001 to determine if the individual meets these requirements. Visit [www.ansi.org](http://www.ansi.org) or [www.aiha.org](http://www.aiha.org).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-15005, filed 10/1/03, effective 1/1/04.]

### **WAC 296-842-160 Training.**

#### **Your responsibility:**

To make sure employees who are required to use respirators understand and can demonstrate proper respirator use and maintenance.

#### **IMPORTANT:**

This section applies to employees who voluntarily use respirators only when training is necessary to prevent the respirator from creating a hazard. See WAC 296-842-110 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-20-114, § 296-842-160, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-16005 Provide effective training.**

**You must:**

- Train employees, based on their duties, if they do any of the following:
  - Use respirators
  - Supervise respirator users
  - Issue, repair, or adjust respirators
- Present effective training in a way that employees understand.

**Note:**

- Training may be provided using audiovisuals, slide presentations, formal classroom instruction, informal discussions during safety meetings, training programs conducted by outside sources, or a combination of these methods.
- You may want to have instructors available when using video or automated training methods to:
  - Encourage and provide responses to questions for the benefit of employees
  - Evaluate employees' understanding of the material
  - Provide other instructional interaction to employees.

**You must:**

- Make sure a qualified instructor provides training
- Provide training, at no cost to the employee, at these times:
  - Initially, before worksite respirator use begins
  - Periodically, within twelve months of the previous training
  - Additionally, when the following occur:
    - The employee has not retained knowledge or skills
    - OR
    - Changes in the worksite, or type of respirator make previous training incomplete or obsolete.

**Note:**

- You may accept an employee's previous training, such as training provided by another employer, to satisfy the initial training requirement if:
  - You can demonstrate the employee received training within the past twelve months
- AND
- The employee can demonstrate the knowledge and skills to use required respirators effectively.
- If you accept an employee's previous training to satisfy the initial training requirement, you are still responsible for providing periodic, and additional training when needed. Periodic training would need to be provided within twelve months of the employee's previous training.

**You must:**

- Make sure employees can demonstrate the following knowledge and skills as required by their duties:
  - Why the respirator is necessary. Include, for example, information identifying respiratory hazards such as hazardous chemicals, the extent of the employee's exposure, and potential health effects and symptoms
  - The respirator's capabilities and limitations. Include, for example, how the respirator provides protection and why air-purifying respirators cannot be used in oxygen-deficient conditions
  - How improper fit, use, or maintenance can compromise the respirator's effectiveness and reliability
  - How to properly inspect, put on, seal check, use, and remove the respirator
  - How to clean, disinfect, repair, and store the respirator, or how to get this done by someone else
  - How to use the respirator effectively in emergency situations; including what to do when a respirator fails and where emergency respirators are stored

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– Medical signs and symptoms that may limit or prevent the effective use of respirators such as shortness of breath or dizziness

– The employer's general obligations under this chapter. For example, developing a written program, selecting appropriate respirators, and providing medical evaluations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-20-114, § 296-842-16005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-170 Maintenance.**

**Your responsibility:**

To make sure respirators are maintained so they will function properly and not create health hazards such as skin irritation.

**You must:**

- Maintain respirators in a clean and reliable condition
- WAC 296-842-17005
- Store respirators properly
- WAC 296-842-17010
- Inspect and repair respirators
- WAC 296-842-17015

**IMPORTANT:**

This section applies to employees who voluntarily use respirators only when maintenance is necessary to prevent the respirator from creating a hazard. See WAC 296-842-110 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 03-20-114, § 296-842-170, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-17005 Maintain respirators in a clean and reliable condition.**

**You must:**

- Make sure respirators are kept, at no cost to the employee, clean, sanitary and in good working order. Do at least the following:
  - Clean and disinfect respirators as often as specified in Table 8 of this section.

**Note:**

- Use required cleaning and disinfecting procedures in WAC 296-842-22015, or the manufacturer's procedures that:
  - Result in a clean and sanitary respirator
  - Do not damage the respirator
  - Do not harm the user
- Automated cleaning and disinfecting are permitted
- Cleaning and disinfecting may be done by a central facility as long as you make sure respirators provided are clean, sanitary, and function properly.

**You must:**

- Make sure respirators are assembled properly after cleaning or disinfecting.
- Use Table 8 to determine how often to clean and disinfect respirators.

**Table 8  
Required Frequencies for Cleaning and Disinfecting Respirators**

If, the respirator will be . . .	Then, clean and disinfect the respirator . . .
• Used exclusively by one employee	• As often as needed to: <ul style="list-style-type: none"> <li>– Keep it clean and functional</li> </ul> AND

[Title 296 WAC—p. 2955]

If, the respirator will be . . .	Then, clean and disinfect the respirator . . .
	<ul style="list-style-type: none"> <li>– To prevent health hazards such as skin irritation</li> </ul>
<ul style="list-style-type: none"> <li>• Shared for nonemergency use</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Used for fit-testing or training</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Before</b> it is worn by another employee</li> </ul>
<ul style="list-style-type: none"> <li>• Shared for emergency use</li> </ul>	<ul style="list-style-type: none"> <li>• <b>After</b> each use so the respirator is immediately ready for use at all times</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-17005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-17010 Store respirators properly.**

**You must:**

- Store respirators to protect them from ALL of the following:
  - Deformation of the facepiece or exhalation valve
  - Sunlight or extreme temperatures or other conditions
  - Contamination such as dust or damaging chemicals
  - Excessive moisture.

**Note:** Use coffee cans, sealable plastic bags, or other suitable means of protection.

**You must:**

- Follow these additional requirements for emergency respirators:
  - Keep respirators accessible to the work area
  - Store respirators in compartments or with covers clearly marked as containing emergency respirators
  - Follow additional storage instructions from the respirator manufacturer
  - Store an adequate number of emergency respirators in each area where they may be needed.

**Note:** Emergency respirators include mouthpiece respirators and other respirators that are limited to escape-only use by their NIOSH certification.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-17010, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-17015 Inspect and repair respirators.**

**You must:**

- Conduct respirator inspections as often as specified in Table 9.
- Make sure respirator inspections cover **all** of the following:
  - Respirator function
  - Tightness of connections
  - The condition of the facepiece, head straps, valves, connecting tubes, and cartridge, canisters or filters
  - Pliability and deterioration of elastomeric parts
  - Maintenance of air or oxygen cylinders
  - Making sure SCBA air cylinders are at ninety percent of the manufacturer's recommended pressure level
  - Proper functioning of SCBA regulators when air-flow is activated
  - Proper functioning of SCBA low-pressure warning devices when activated

- Certify inspections for emergency respirators by documenting the following:

- Inspection date
- Serial number of each respirator or other identifying information
- Inspector's name or signature
- Inspection findings
- Required action, if problems are found.

**Note:**

- When documenting inspections you may either:
  - Provide the information on a tag or label and attach it to the respirator compartment**OR**
  - Include the information in an inspection report stored in paper or electronic files accessible to employees.

**You must:**

- Repair or replace any respirator that is not functioning properly **before** the employee returns to a situation where respirators are required.

- If respirators fail inspection or are not functioning properly during use due to problems such as leakage, vapor or gas breakthrough, or increased breathing resistance, **ALL** of the following apply:

- Do **NOT** permit such respirators to be used until properly repaired or adjusted
- Use only NIOSH-certified parts
- Make sure repairs and adjustments are made by appropriately trained individuals
  - Use the manufacturer or a technician trained by the manufacturer to repair or adjust reducing and admission valves, regulators, and warning devices on SCBAs or air-line respirators.

■ Follow the manufacturer's recommendations and specifications for the type and extent of repairs.

Use Table 9 to determine how often to inspect respirators.

**Table 9  
Required Frequencies for Respirator Inspections**

If the respirator is . . .	Then inspect . . .
A SCBA in any use	<ul style="list-style-type: none"> <li>• Before <b>each</b> use</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>• During cleaning</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Monthly if <b>NOT</b> used</li> </ul>
Used for nonemergencies, including day-to-day or infrequent use	<ul style="list-style-type: none"> <li>• Inspect before each use</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>• During cleaning</li> </ul>
Used only for emergencies	<ul style="list-style-type: none"> <li>• Check for proper function before <b>and</b> after <b>each</b> use</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>• Inspect at least monthly as instructed by the manufacturer</li> </ul>
Used for escape-only purposes	<ul style="list-style-type: none"> <li>• Before carrying into a work place for use</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-17015, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-180 Safe use and removal of respirators.****Your responsibility:**

To make sure respirator use and removal is safe.

**Exemption:** These sections do NOT apply to employees who voluntarily use any type of respirator. See WAC 296-842-110 for voluntary use requirements.

**You must:**

Prevent sealing problems with tight-fitting respirators

WAC 296-842-18005

Make sure employees leave the use area before removing respirators

WAC 296-842-18010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-180, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-18005 Prevent sealing problems with tight-fitting respirators.****You must:**

- Make sure employees use the procedure in WAC 296-842-22020 to perform a user seal check each time they put on their tight-fitting respirator.

- Make sure you do NOT permit respirator use if employees have a characteristic that interferes with the respirator facepiece seal or valve function. For example, stubble, mustaches, sideburns, bangs, hairlines, or scars between the face and the sealing surface of the respirator will affect the seal.

- Make sure corrective glasses or personal protective equipment (PPE) do NOT interfere with the facepiece seal. Examples of PPE include safety glasses, goggles, faceshields, clothing, and hard hats.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-18005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-18010 Make sure employees leave the use area before removing respirators.****You must:**

- Make sure employees leave the use area for any of these reasons:

- To replace air-purifying filters, cartridges, or canisters
- When they smell or taste (detect) vapor or gas leakage from, for example, cartridges, canister, or the facepiece seal
- When they detect changes in breathing resistance
- To readjust their respirators
- To wash their faces and respirators as necessary to prevent skin or eye irritation
- If they become ill
- If they experience sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, or chills.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-18010, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-190 Standby requirements for immediately dangerous to life or health (IDLH) conditions.****Your responsibility:**

To provide adequate assistance to employees using respirators in conditions immediately dangerous to life or health (IDLH).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-190, filed 10/1/03, effective 1/1/04.]

(2007 Ed.)

**WAC 296-842-19005 Provide standby assistance in immediately dangerous to life or health (IDLH) conditions.****IMPORTANT:**

WISHA currently uses the IDLH values in the 1990 NIOSH *Pocket Guide to Chemical Hazards* to determine the existence of IDLH conditions. You may use more recent editions of this guide. Visit [www.cdc.gov/niosh](http://www.cdc.gov/niosh) for more information.

**You must:**

- Provide at least two standby employees outside the IDLH area.

**Note:** You need only one standby employee if the IDLH condition is well characterized, will remain stable AND you can show one employee can adequately do ALL of the following:

- Monitor employees in the IDLH area
- Implement communication
- Initiate rescue duties.
- Train and equip standby employees to provide effective emergency rescue. Equip them with:
  - A pressure-demand SCBA or a pressure-demand air-line respirator with an auxiliary SCBA, for each standby employee
  - Appropriate retrieval equipment, when it would help with the effective rescue of the entrant, or an equivalent means of rescue
- Make sure standby employees maintain visual, voice, or signal line communication with employees in the IDLH area
- Make sure that in the event of an emergency:
  - Standby employees notify you or your designee before they enter the IDLH area to provide emergency rescue
  - You provide necessary assistance when notified.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-19005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-200 Air quality for self-contained breathing apparatus (SCBA) and air-line respirators.****Your responsibility:**

To provide employees who use SCBAs or air-line respirators with an acceptable air supply.

**You must:**

Make sure breathing air and oxygen meet established specifications

WAC 296-842-20005

Prevent conditions that could create a hazardous breathing air supply

WAC 296-842-20010

Make sure compressors do not create a hazardous breathing air supply

WAC 296-842-20015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-200, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-20005 Make sure breathing air and oxygen meet established specifications.****You must:**

- Make sure that all SCBAs and air-line respirators are provided with safe breathing air and oxygen according to the following:

- Compressed breathing air must meet the following specifications for Grade D air:

[Title 296 WAC—p. 2957]

- Oxygen (volume/volume) within 19.5-23.5%
- Hydrocarbon (condensed): NO MORE than five milligrams per cubic meter of air
- Carbon **monoxide** (CO): NO MORE than ten parts per million (ppm)
- Carbon **dioxide** (CO<sub>2</sub>): NO MORE than 1,000 ppm
- No noticeable odor

**Reference:** See the American National Standards Institute - Compressed Gas Association Commodity Specification for Air (G-7.1.1989) for more information. Contact your local library to access a copy.

– Make sure the moisture content of the air supplied meets the following:

■ Air supplied to respirators from cylinders must **NOT** exceed a dew point of -50°F (or -45.6°C) at 1 atmospheric pressure.

■ Compressor supplied air must **NOT** exceed a dew point of 10°F (or 5.56°C) **BELOW** the use temperature at 1 atmospheric pressure.

– Cylinders obtained from a supplier of breathing air must have a certificate of analysis that verifies each cylinder's contents meet Grade D and dew point standards.

– Compressed and liquid oxygen must meet the United States Pharmacopoeia requirements for medical or breathing oxygen.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-20005, filed 10/1/03, effective 1/1/04.]

### **WAC 296-842-20010 Prevent conditions that could create a hazardous breathing air supply.**

#### **You must:**

- Use SCBA and air-line respirators safely:
- Do **NOT** supply compressed oxygen to SCBAs or air-line respirators that previously used compressed air.

**Note:** Compressed air leaves residues containing hydrocarbons such as oil or grease. Fire or explosion can occur if compressed oxygen makes contact with these residues.

#### **You must:**

– Use breathing air couplings on air-line respirators that are **NOT** compatible with couplings for nonrespirable air or other gas systems, for example, utility air used for manufacturing purposes.

– Do **NOT** allow asphyxiating substances to enter breathing air lines; for example, do not flush nitrogen through worksite air lines also used for breathing air.

– Use equipment specifically designed for oxygen service or distribution **IF** oxygen concentrations greater than 23.5% are used.

**Note:** Respiratory equipment **NOT** designed for oxygen service or distribution can create fire or explosion hazards in oxygen concentrations higher than 23.5%.

#### **You must:**

– Make sure cylinders used to supply breathing air for SCBAs or air-line respirators are tested and maintained as described in the federal Department of Transportation's (DOT) Shipping Container Specification Regulations, Title 49 CFR Parts 173 and 178.

**Note:**

- Use only cylinders marked (with serial number, cylinder pressure, DOT exemption number, and test dates) according to these DOT regulations
- To find any Code of Federal Regulations (CFR) visit: [www.access.gpo.gov](http://www.access.gpo.gov).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-20010, filed 10/1/03, effective 1/1/04.]

### **WAC 296-842-20015 Make sure compressors do not create a hazardous breathing air supply.**

#### **IMPORTANT:**

• Ambient-air movers (or pumps) used to supply air to respirators must be used according to the manufacturer's instructions.

• Respirators used with ambient-air movers must be approved by NIOSH to operate within the pressure ranges of the air mover.

#### **You must:**

(1) Locate or modify compressor intakes so they will not pick up contaminated air **OR** exhaust gases such as carbon monoxide from:

- Fuel-powered vehicles

#### **OR**

- The internal combustion motor of the compressor

#### **OR**

• Other contaminant sources in the area, for example, a ventilation system discharge.

#### **Note:**

• You may need to reposition or extend the compressor's intake or engine exhaust pipe or outlet, especially if they are located near each other.

• Be aware that exhaust gases may not adequately disperse when the compressor is operated in:

– An enclosed space such as a small room, a corner, or near a wall

#### **OR**

– In turbulent wind conditions.

#### **You must:**

(2) Equip compressors with suitable air-purifying filters, water traps, and sorbents (such as charcoal beds) and maintain them as follows:

• Periodically change or clean them according to the manufacturer or supplier's instructions

• Keep a tag at the compressor with the following information:

– When the sorbent and filters were last replaced or cleaned

– The date of the most recent changes or cleaning

– The signature of the person authorized by the employer to perform changes or cleaning.

#### **Note:**

To be sure you are providing the recommended operating pressure for respirators, you may need to install a delivery pressure gauge at the point where the manifold where the respirator hose is attached.

#### **You must:**

(3) Make sure the carbon monoxide (CO) level in breathing air from compressors does **NOT** exceed ten parts per million (ppm).

#### **Note:**

If you do not have a reliable CO-free area available for locating your compressor intake, consider these examples of methods to prevent CO contamination of the air supply:

• Use of continuous and effective carbon monoxide alarms and filters

• Conduct frequent monitoring of air quality

• Use a CO converter (converts CO to carbon dioxide).

#### **You must:**

• Maintain CO levels in oil lubricated compressors by using at least one of the following:

– An effective CO alarm

– An effective high temperature alarm **AND** testing the air supply often enough to see if CO levels exceed ten ppm.

- Note:**
- How often to test depends on a number of considerations, for example:
    - Compressor age
    - Maintenance history of the compressor
    - Stability of CO readings
  - If the CO or high temperature alarm cannot be heard by the employee, a flashing light or other effective alternative to an audio alarm needs to be used
  - Safeguards, such as alarms, are necessary to prevent CO contamination resulting from compressor overheating
  - Any type of oil-lubricated compressor, such as screw or piston types, may produce dangerous levels of CO if overheating occurs
  - Old compressors are known to leak oil due to worn parts, increasing the possibility for overheating. Newer compressors may also overheat if maintenance practices are poor. For example, poor maintenance practices may lead to disconnected or incorrectly set alarms, inoperative shut-offs, or an impaired cooling system
  - You need to instruct employees to move to a safe area when the alarm sounds AND to stop using respirators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-20015, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-210 Labeling of air-purifying respirator filters, cartridges, and canisters.**

**Your responsibility:**

To make sure employees, their supervisors, and program administrators can easily check for the correct air-purifying filters, cartridges, and canisters on respirators.

**Exemption:** This section does NOT apply to filtering-facepiece respirators when used voluntarily. See WAC 296-842-110 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-210, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-21005 Keep labels readable on respirator filters, cartridges, and canisters during use.**

**You must:**

- Make sure the NIOSH certification labeling and color-coding on air-purifying respirator filters, cartridges, and canisters remains readable and intact during use.

**Link:** Color-coding specifications for manufacturers can be found in Title 42 CFR, Part 84. Visit [www.cdc.gov/niosh](http://www.cdc.gov/niosh).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-21005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-220 Required procedures for respiratory protection program.**

**Your responsibility:**

To use the procedures and questionnaire provided in this section when implementing your respiratory protection program.

**You must:**

- Use this medical questionnaire for medical evaluations WAC 296-842-22005
- Follow these fit-testing procedures for tight-fitting respirators WAC 296-842-22010

Follow procedures established for cleaning and disinfecting respirators

WAC 296-842-22015

Follow procedures established for seal checking respirators

WAC 296-842-22020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-220, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-22005 Use this medical questionnaire for medical evaluations.**

**You must:**

- Use the medical questionnaire in Table 10 when conducting medical evaluations.

- Note:**
- You may use a physical exam instead of this questionnaire if the exam covers the same information as the questionnaire.
  - You may use on-line questionnaires if the questions are the same and the requirements in WAC 296-842-140 of this chapter are met.
  - You may choose to send the questionnaire to the LCHP ahead of time, giving time to review it and add any necessary questions.
  - The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

**Table 10**

<b>WISHA Medical Evaluation Questionnaire</b>	
<b>Employer instructions:</b>	
<ul style="list-style-type: none"> <li>• You may use on-line questionnaires if the requirements in WAC 296-842-14005 are met.</li> <li>• You must tell your employee how to deliver or send the completed questionnaire to the health care provider you have selected.</li> <li>• You must NOT review employees' questionnaires.</li> </ul>	
<b>Health care provider's instructions:</b>	
<ul style="list-style-type: none"> <li>• Review the information in this questionnaire and any additional information provided to you by the employer.</li> <li>• You may add questions to this questionnaire at your discretion; HOWEVER, questions in Parts 1-3 may not be deleted or substantially altered.</li> <li>• Follow-up evaluation is required for any positive response to questions 1-8 in Part 2, or questions 1-6 in Part 3. This might include: Phone consultations to evaluate positive responses, medical tests, and diagnostic procedures.</li> <li>• When your evaluation is complete, send a copy of your written recommendation to the employer AND employee.</li> </ul>	
<b>Employee information and instructions:</b>	
<ul style="list-style-type: none"> <li>• Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you.</li> <li>• Your employer or supervisor must not look at or review your answers at any time.</li> </ul>	

**Part 1 - Employee Background Information**

**ALL employees must complete this part**

**Please print**

1. Today's date: \_\_\_\_\_
2. Your name: \_\_\_\_\_
3. Your age (to nearest year): \_\_\_\_\_

4. Sex (circle one): Male / Female			
5. Your height: ____ft. ____in.			
6. Your weight: _____lbs.			
7. Your job title: _____			
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include Area Code): _____			
9. The best time to call you at this number: _____			
10. Has your employer told you how to contact the health care professional who will review this questionnaire?	Yes	/	No
11. Check the type of respirator(s) you will be using:			
a. ____ N, R, or P filtering-facepiece respirator (for example, a dust mask, OR an N95 filtering-facepiece respirator).			
b. Check all that apply.			
<input type="checkbox"/> Half mask <input type="checkbox"/> Full facepiece mask <input type="checkbox"/> Helmet hood <input type="checkbox"/> Escape			
<input type="checkbox"/> Nonpowered cartridge or canister <input type="checkbox"/> Powered air-purifying cartridge respirator (PAPR)			
<input type="checkbox"/> Supplied-air or Air-line			
Self contained breathing apparatus (SCBA): <input type="checkbox"/> Demand or <input type="checkbox"/> Pressure demand			
Other: _____			
12. Have you previously worn a respirator?	Yes	/	No
If "yes," describe what type(s): _____			
<b>Part 2 - General Health Information</b>			
<b>ALL employees must complete this part</b>			
<b>Please circle "Yes" or "No"</b>			
1. Do you <i>currently</i> smoke tobacco, or have you smoked tobacco in the last month?	Yes	/	No
2. Have you <i>ever had</i> any of the following conditions?			
a. Seizures (fits):	Yes	/	No
b. Diabetes (sugar disease):	Yes	/	No
c. Allergic reactions that interfere with your breathing:	Yes	/	No
d. Claustrophobia (fear of closed-in places):	Yes	/	No
e. Trouble smelling odors:	Yes	/	No
3. Have you <i>ever had</i> any of the following pulmonary or lung problems?			
a. Asbestosis:	Yes	/	No
b. Asthma:	Yes	/	No
c. Chronic bronchitis:	Yes	/	No
d. Emphysema:	Yes	/	No
e. Pneumonia:	Yes	/	No
f. Tuberculosis:	Yes	/	No
g. Silicosis:	Yes	/	No
h. Pneumothorax (collapsed lung):	Yes	/	No
i. Lung cancer:	Yes	/	No
j. Broken ribs:	Yes	/	No
k. Any chest injuries or surgeries:	Yes	/	No
l. Any other lung problem that you have been told about:	Yes	/	No
4. Do you <i>currently</i> have any of the following symptoms of pulmonary or lung illness?			
a. Shortness of breath:	Yes	/	No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline:	Yes	/	No
c. Shortness of breath when walking with other people at an ordinary pace on level ground:	Yes	/	No
d. Have to stop for breath when walking at your own pace on level ground:	Yes	/	No
e. Shortness of breath when washing or dressing yourself:	Yes	/	No
f. Shortness of breath that interferes with your job:	Yes	/	No
g. Coughing that produces phlegm (thick sputum):	Yes	/	No
h. Coughing that wakes you early in the morning:	Yes	/	No
i. Coughing that occurs mostly when you are lying down:	Yes	/	No
j. Coughing up blood in the last month:	Yes	/	No
k. Wheezing:	Yes	/	No
l. Wheezing that interferes with your job:	Yes	/	No
m. Chest pain when you breathe deeply:	Yes	/	No
n. Any other symptoms that you think may be related to lung problems:	Yes	/	No
5. Have you <i>ever had</i> any of the following cardiovascular or heart problems?			
a. Heart attack:	Yes	/	No
b. Stroke:	Yes	/	No
c. Angina:	Yes	/	No

d. Heart failure:	Yes	/	No
e. Swelling in your legs or feet (not caused by walking):	Yes	/	No
f. Heart arrhythmia (heart beating irregularly):	Yes	/	No
g. High blood pressure:	Yes	/	No
h. Any other heart problem that you have been told about:	Yes	/	No
6. Have you <i>ever had</i> any of the following cardiovascular or heart symptoms?			
a. Frequent pain or tightness in your chest:	Yes	/	No
b. Pain or tightness in your chest during physical activity:	Yes	/	No
c. Pain or tightness in your chest that interferes with your job:	Yes	/	No
d. In the past 2 years, have you noticed your heart skipping or missing a beat:	Yes	/	No
e. Heartburn or indigestion that is not related to eating:	Yes	/	No
f. Any other symptoms that you think may be related to heart or circulation problems:	Yes	/	No
7. Do you <i>currently</i> take medication for any of the following problems?	Yes	/	No
a. Breathing or lung problems:	Yes	/	No
b. Heart trouble:	Yes	/	No
c. Blood pressure:	Yes	/	No
d. Seizures (fits):	Yes	/	No
8. If you have used a respirator, have you <i>ever had</i> any of the following problems? (If you have never used a respirator, check the following space and go to question 9): _____			
a. Eye irritation:	Yes	/	No
b. Skin allergies or rashes:	Yes	/	No
c. Anxiety:	Yes	/	No
d. General weakness or fatigue:	Yes	/	No
e. Any other problem that interferes with your use of a respirator?	Yes	/	No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers?	Yes	/	No
<b>Part 3 - Additional Questions for Users of Full-Facepiece Respirators or SCBAs</b>			
<b>Please circle "Yes" or "No"</b>			
1. Have you <i>ever lost</i> vision in either eye (temporarily or permanently)?	Yes	/	No
2. Do you <i>currently</i> have any of these vision problems?			
a. Need to wear contact lenses:	Yes	/	No
b. Need to wear glasses:	Yes	/	No
c. Color blindness:	Yes	/	No
d. Any other eye or vision problem:	Yes	/	No
3. Have you <i>ever had</i> an injury to your ears, including a broken ear drum?	Yes	/	No
4. Do you <i>currently</i> have any of these hearing problems?			
a. Difficulty hearing:	Yes	/	No
b. Need to wear a hearing aid:	Yes	/	No
c. Any other hearing or ear problem:	Yes	/	No
5. Have you <i>ever had</i> a back injury?	Yes	/	No
6. Do you <i>currently</i> have any of the following musculoskeletal problems?			
a. Weakness in any of your arms, hands, legs, or feet:	Yes	/	No
b. Back pain:	Yes	/	No
c. Difficulty fully moving your arms and legs:	Yes	/	No
d. Pain or stiffness when you lean forward or backward at the waist:	Yes	/	No
e. Difficulty fully moving your head up or down:	Yes	/	No
f. Difficulty fully moving your head side to side:	Yes	/	No
g. Difficulty bending at your knees:	Yes	/	No
h. Difficulty squatting to the ground:	Yes	/	No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes	/	No
j. Any other muscle or skeletal problem that interferes with using a respirator:	Yes	/	No
<b>Part 4 - Discretionary Questions</b>			
<b>Complete questions in this part ONLY if your employer's health care provider says they are necessary</b>			
1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen?	Yes	/	No
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these conditions:	Yes	/	No
2. Have you ever been exposed (at work or home) to hazardous solvents, hazardous airborne chemicals (such as gases, fumes, or dust), OR have you come into skin contact with hazardous chemicals? If "yes," name the chemicals, if you know them: _____	Yes	/	No
3. Have you ever worked with any of the materials, or under any of the conditions, listed below:			

a. Asbestos?	Yes	/	No
b. Silica (for example, in sandblasting)?	Yes	/	No
c. Tungsten/cobalt (for example, grinding or welding this material)?	Yes	/	No
d. Beryllium?	Yes	/	No
e. Aluminum?	Yes	/	No
f. Coal (for example, mining)?	Yes	/	No
g. Iron?	Yes	/	No
h. Tin?	Yes	/	No
i. Dusty environments?	Yes	/	No
j. Any other hazardous exposures?	Yes	/	No
If "yes," describe these exposures: _____			
4. List any second jobs or side businesses you have: _____			
5. List your previous occupations: _____			
6. List your current and previous hobbies: _____			
7. Have you been in the military services?	Yes	/	No
If "yes," were you exposed to biological or chemical agents (either in training or combat)?			
8. Have you ever worked on a HAZMAT team?	Yes	/	No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)?			
	Yes	/	No
If "yes," name the medications if you know them: _____			
10. Will you be using any of the following items with your respirator(s)?			
a. HEPA filters:	Yes	/	No
b. Canisters (for example, gas masks):	Yes	/	No
c. Cartridges:	Yes	/	No
11. How often are you expected to use the respirator(s)?			
a. Escape-only (no rescue):	Yes	/	No
b. Emergency rescue only:	Yes	/	No
c. Less than 5 hours <i>per week</i> :	Yes	/	No
d. Less than 2 hours <i>per day</i> :	Yes	/	No
e. 2 to 4 hours per day:	Yes	/	No
f. Over 4 hours per day:			
12. During the period you are using the respirator(s), is your work effort:			
a. <i>Light</i> (less than 200 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: _____hrs. _____mins.			
Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.			
b. <i>Moderate</i> (200 to 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: _____hrs. _____mins.			
Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.			
c. <i>Heavy</i> (above 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: _____hrs. _____mins.			
Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).			
13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator?			
	Yes	/	No
If "yes," describe this protective clothing and/or equipment: _____			
14. Will you be working under hot conditions (temperature exceeding 77°F):	Yes	/	No
15. Will you be working under humid conditions:	Yes	/	No
16. Describe the work you will be doing while using your respirator(s): _____			
17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases): _____			
18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):			

Name of the first toxic substance: \_\_\_\_\_  
 Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 Name of the second toxic substance: \_\_\_\_\_  
 Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 Name of the third toxic substance: \_\_\_\_\_  
 Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 The name of any other toxic substances that you will be exposed to while using your respirator: \_\_\_\_\_  
 19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well being of others (for example, rescue, security). \_\_\_\_\_

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-22005, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-22010 Follow these fit-testing procedures for tight-fitting respirators.**

**IMPORTANT:**

- This section contains procedural requirements that apply during actual fit testing.
- See WAC 296-842-150 of this chapter for fit-testing requirements that apply to your overall program.

**Exemptions:** This section does NOT apply to employees who:

- Voluntarily use respirators

**OR**

- Are required to use mouthpiece respirators.

**You must:**

- Conduct fit testing according to all of the following:
  - Follow the procedure in Table 11 to choose a respirator for fit testing:
    - Prior to conducting fit tests
  - AND**
  - Any time your employee must select a different respirator such as when a previously selected respirator fails a test
    - Select and follow at least one of the following fit test procedures:
      - Qualitative fit-test procedures:
        - ◆ Isoamyl acetate vapor (IAA, banana oil) in Table 12
        - ◆ Saccharine aerosol in Table 13
        - ◆ Bitrex™ aerosol in Table 14
        - ◆ Irritant smoke in Table 15
      - Quantitative fit-test procedures:
        - ◆ Ambient aerosol condensation nuclei counter such as the Portacount™, in Table 16
        - ◆ Controlled negative pressure (CNP) such as the Fit-Tester 3000™, in Table 17
        - ◆ Generated aerosol in Table 18
          - Make sure employees perform the appropriate fit-test exercises listed in Table 19.
          - Clean and maintain equipment according to the manufacturer's instructions.
          - Make sure during fit testing employees wear any safety equipment that could:
            - Interfere with respirator fit
      - AND**
      - Be worn in the workplace. For example, chemical splash goggles.
        - Check, prior to fit testing, for conditions that may interfere with the respirator seal or valve functions. If you find such conditions, do NOT conduct fit testing for that individual.

(2007 Ed.)

**Note:** Examples of conditions that may interfere with the respirator seal or valve functions include:

- Moustache, stubble, sideburns, bangs, hairline, and other types of facial hair in areas where the respirator facepiece seals or that interfere with valve function
- Temple bars of corrective eyewear or headgear that extend through the face seal area.

**Table 11**

**Procedure for Choosing a Respirator for Fit Testing**

1. **Inform** the employee:
    - To choose the most comfortable respirator that provides an adequate fit
    - That each respirator sample represents a different size and, if more than one model is supplied, a different shape
    - That if fitted and used properly, the respirator chosen will provide adequate protection
  2. **Provide** a mirror and show the employee how to:
    - Put on the respirator
    - Position the respirator on the face
    - Set strap tension.
- Note:** This instruction does NOT take the place of the employee's formal training since it is only a review.
3. **Review** with the employee how to check for a comfortable fit around the nose, cheeks and other areas on the face.
    - Tell the employee the respirator should be comfortable while talking or wearing eye protection.
  4. **Have the employee** hold each facepiece against the face, taking enough time to compare the fit of each. The employee can then either:
    - Reject any facepiece that clearly does not feel comfortable or fit adequately

**OR**

    - Choose which facepiece is most acceptable and which are less acceptable, if any.
- Note:**
- Supply as many respirator models and sizes as needed to make sure the employee finds a respirator that is acceptable and fits correctly
  - To save time later, during this step note the more acceptable facepieces in case the one chosen fails the fit test or proves unacceptable later.
5. **Have the employee wear** the most acceptable respirator for **AT LEAST 5 minutes** to evaluate comfort and fit. Do **ALL** of the following during this time:

[Title 296 WAC—p. 2963]

<b>Procedure for Choosing a Respirator for Fit Testing</b>
<ul style="list-style-type: none"> <li>• Ask the employee to observe and comment about the comfort and fit:               <ul style="list-style-type: none"> <li>– Around the nose, cheeks, and other areas on the face</li> <li>– When talking or wearing eye protection</li> </ul> </li> <li>• Have the employee put on the respirator and adjust the straps until they show proficiency</li> <li>• Evaluate the respirator's general fit by checking:               <ul style="list-style-type: none"> <li>– Proper chin placement</li> <li>– Properly tightened straps (do <b>NOT</b> over tighten)</li> <li>– Acceptable fit across the nose bridge</li> <li>– Respirator size; it must span the distance from nose to chin</li> <li>– To see if the respirator stays in position</li> </ul> </li> <li>• Have the employee complete a successful seal check as specified in WAC 296-842-22025 of this chapter               <ul style="list-style-type: none"> <li>– Prior to the seal check they must settle the respirator on their face by taking a few slow deep breaths <b>WHILE SLOWLY:</b> <ul style="list-style-type: none"> <li>■ Moving their head from side-to-side</li> <li>AND</li> <li>■ Up and down.</li> </ul> </li> </ul> </li> </ul> <p>6. <b>If the employee finds the respirator unacceptable</b>, allow the employee to select another one and return to Step 5. Otherwise, proceed to Step 7.</p> <p>7. <b>Before starting the fit test</b>, you must:</p> <ul style="list-style-type: none"> <li>• Describe the fit test including screening procedures, employee responsibilities, and test exercises</li> <li>AND</li> <li>• Make sure the employee wears the respirator <b>AT LEAST</b> five minutes.</li> </ul>

Table 12

<b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• The success of this test depends on preserving the employee's odor sensitivity to isoamyl acetate (IAA) vapor               <ul style="list-style-type: none"> <li>– Vapor accumulations in ambient air can decrease odor sensitivity. To prevent this:                   <ul style="list-style-type: none"> <li>■ Prepare <b>ALL</b> solutions in a location separate from screening and test areas</li> <li>■ Conduct screening and tests in separate well-ventilated rooms. For example, use an exhaust fan or laboratory hood to prevent IAA vapor from accumulating in the room air</li> </ul> </li> <li>– Always use odor-free water, for example, distilled or spring water that is 25°C (77°F).</li> </ul> </li> <li>• Isoamyl acetate is also known as isopentyl acetate.</li> </ul>
<b>Screening Preparations</b>
<p><b>Important:</b></p> <p>Odor threshold screening determines if the employee can detect weak concentrations of IAA vapor.</p> <ol style="list-style-type: none"> <li>1. Choose an appropriate location to conduct screening.           <ul style="list-style-type: none"> <li>• Conduct screening and tests in separate well-ventilated rooms.</li> </ul> </li> <li>2. Prepare a stock solution <b>AT LEAST</b> weekly as follows:</li> </ol>

<b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b>
<ul style="list-style-type: none"> <li>• Add one milliliter (ml) of pure IAA to 800 ml of odor-free water in a one-liter glass jar with a metal lid using a measuring dropper or pipette</li> <li>• Seal the jar with the lid and shake it for 30 seconds</li> <li>• Clean the dropper or pipette.</li> </ul> <ol style="list-style-type: none"> <li>3. Prepare the odor test solution daily as follows:           <ul style="list-style-type: none"> <li>• Add 0.4 ml from the stock solution to 500 ml of water in a one liter glass jar with a metal lid using a clean pipette or dropper</li> <li>• Seal the jar with the lid and shake it for 30 seconds</li> <li>• Let this solution stand for 2-3 minutes so the IAA concentration above the liquid reaches equilibrium</li> <li>• Label this jar so you know the contents but the employee cannot know its contents, for example, "1."</li> </ul> </li> </ol> <p><b>Note:</b></p> <p>To maintain the integrity of the test, use labels that peel off easily <b>AND</b> periodically switch the labels.</p> <ol style="list-style-type: none"> <li>4. Prepare a "test blank" solution as follows:           <ul style="list-style-type: none"> <li>• Add 500 ml of odor-free water to a one liter glass jar with a metal lid</li> <li>• Seal the jar</li> <li>• Label the jar so you know the contents but the employee cannot know its contents.</li> </ul> </li> <li>5. Type or neatly print the following instructions on a card and place it on the table in front of the two test jars:           <p><i>"The purpose of this test is to find out if you can smell banana oil at a low concentration. While both jars contain water, one <b>ALSO</b> contains a small amount of banana oil.</i></p> <p><i>Make sure the lid is secure then pick up a jar and shake it for two seconds. Open the jar and sniff at the opening. Repeat this for the second jar.</i></p> <p><i>Tell the individual conducting the fit test which jar contains banana oil."</i></p> </li> </ol>
<b>Test Preparations</b>
<ol style="list-style-type: none"> <li>6. Choose an appropriate location to conduct fit testing.           <ul style="list-style-type: none"> <li>• Conduct screening and tests in separate well-ventilated rooms.</li> </ul> </li> <li>7. Assemble the fit test enclosure in the room.           <ul style="list-style-type: none"> <li>• Invert a clear 55-gallon drum liner over a circular 2-foot diameter frame made of plywood or other light-weight rigid material <b>OR</b> construct a similar enclosure using plastic sheeting</li> <li>• Hang the frame with the plastic covering so the top of the enclosure is about six inches above the employee's head</li> <li>• Attach a small hook inside top center of the enclosure</li> <li>• Tape a copy of the test exercises (see Table 28) to the inside of the test enclosure where the employee can read it.</li> </ul> </li> <li>8. Have organic vapor cartridges or equivalent on hand for each employee's chosen respirator.</li> <li>9. Have ready a 6 x 5-inch piece of paper towel or other porous absorbent single-ply material <b>AND</b> 0.75 ml of pure IAA. Do <b>NOT</b> apply IAA yet.</li> </ol> <p><b>Note:</b></p> <p>As an alternative to using the paper towel, you may use an IAA test swab <b>OR</b> ampoule if it has been demonstrated to generate an equivalent test concentration.</p>

<b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b>
<b>Screening</b>
<p>10. Have the employee, while <b>NOT</b> wearing a respirator, follow the instructions on the card provided.</p> <ul style="list-style-type: none"> <li>• If the employee correctly identifies the jar containing IAA, proceed to conduct testing (Step 11)</li> <li>• If the employee is <b>NOT</b> able to correctly identify the jar containing IAA, you must <b>STOP</b> and use a different fit test protocol.</li> </ul>
<b>Test</b>
<p>11. <b>BEFORE</b> entering the fit test room, have the employee attach cartridges, put on, properly adjust, and seal check the respirator. Have the employee enter the test enclosure.</p> <p>12. Wet the paper towel with 0.75 ml of <b>pure</b> IAA <b>AND</b> fold it in half.</p> <p>13. Pass the paper towel to the employee inside the enclosure <b>AND</b> instruct the employee to hang it on the hook at the top of the enclosure.</p> <p>14. Wait two minutes for the IAA vapor to fill the enclosure.</p> <ul style="list-style-type: none"> <li>• While waiting, explain the fit test, including the purpose of the test exercises, the importance of cooperation, and that you must be informed if a banana-like odor is detected during the test</li> <li>• You may also demonstrate the test exercises.</li> </ul> <p>15. Have the employee perform the appropriate fit-test exercises in Table 19.</p> <ul style="list-style-type: none"> <li>• If the employee does <b>NOT</b> detect IAA while performing test exercises, the fit test has been <b>PASSED</b>. Proceed as follows: <ul style="list-style-type: none"> <li>– <b>BEFORE</b> leaving the enclosure, have the employee break the respirator seal and inhale. If they <b>detect</b> IAA, the test is valid</li> <li>– When exiting the employee must remove the paper towel and give it to the individual conducting the fit test. This prevents IAA vapor from building up in the enclosure during subsequent tests</li> <li>– The individual conducting the fit test must keep used paper towels in a self-sealing plastic bag to prevent area contamination</li> </ul> </li> <li>• If the employee detects IAA during any test exercise, the fit test has <b>FAILED</b>. <b>STOP</b> and have the employee do the following: <ul style="list-style-type: none"> <li>– Quickly return to the selection room to remove the respirator. This avoids decreasing the employee's odor sensitivity</li> <li>– Select another respirator</li> <li>– Repeat screening and testing <ul style="list-style-type: none"> <li>■ At this stage, if the employee fails the screening part of this procedure, the employee can repeat it <b>AFTER</b> waiting at least five minutes for odor sensitivity to return.</li> </ul> </li> </ul> </li> </ul>

Table 13

<b>Saccharin Aerosol Test Procedure</b>
<b>Screening Preparations</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> </ul>

<b>Saccharin Aerosol Test Procedure</b>
<b>Screening Preparations</b>
<ul style="list-style-type: none"> <li>• Taste threshold screening determines whether the employee being tested can detect the taste of saccharin <ul style="list-style-type: none"> <li>– The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the fit test. Sweet foods or drink consumed before the test may make the employee unable to detect saccharin during screening</li> <li>– Nebulizers must be thoroughly rinsed in water and shaken dry: <ul style="list-style-type: none"> <li>■ Each morning and afternoon</li> </ul> </li> </ul> </li> <li><b>OR</b></li> <li>■ At least every four hours.</li> <li>• You may use commercially prepared solutions if they meet the requirements in this procedure.</li> </ul> <p>1. Obtain a test enclosure (hood) that meets the following specifications:</p> <ul style="list-style-type: none"> <li>• Twelve inches in diameter by fourteen inches tall</li> <li>• A clear front portion</li> <li>• Enough space inside to allow free movement of the head when a respirator is worn</li> <li>• A 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications</li> <li>• This enclosure can also be used for testing.</li> </ul> <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers <b>OR</b> equivalent.</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> <li>• Dissolve 830.0 milligrams of sodium saccharin USP in 100 ml of warm distilled water</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• <b>IF</b> you have already prepared the fit-test solution, you can make the screening solution by adding 1 ml of this solution to 100 ml of distilled water.</li> </ul> <p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one to be used for fit testing.</li> </ul>
<b>Test Preparations</b>
<p>5. Prepare the fit-test solution as follows:</p> <ul style="list-style-type: none"> <li>• Add 83.0 grams of sodium saccharin to 100 ml of warm water.</li> </ul> <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one used for screening</li> </ul> <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>
<b>Screening</b>
<p>8. Have the employee, while <b>NOT</b> wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breathe through a slightly open mouth with tongue extended during screening <b>AND</b> testing</li> <li>• Immediately report when a sweet taste is detected.</li> </ul> <p>10. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer saccharin as follows:</p>

<b>Saccharin Aerosol Test Procedure</b>
<b>Screening Preparations</b>
<ul style="list-style-type: none"> <li>• Direct the nozzle away from the employee's nose and mouth</li> <li>• Complete 10 squeezes in rapid succession</li> <li>• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.</li> </ul> <p>11. Ask the employee if a sweet taste is detected.</p> <ul style="list-style-type: none"> <li>• If <b>YES</b>, screening is completed. Proceed to conduct testing, Step 14, <b>AFTER</b> you:             <ul style="list-style-type: none"> <li>– Ask the employee to remember the taste for reference during the fit test</li> <li>– Note the employee's taste threshold as "10" regardless of the number of squeezes actually completed</li> </ul> </li> <li>• If <b>NO</b>, screening must continue. Proceed to Step 12.</li> </ul> <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; <b>EXCEPT</b> this time note the employee's taste threshold as "20" <b>IF</b> a sweet taste is reported.</p> <ul style="list-style-type: none"> <li>• If a sweet taste is still <b>NOT</b> detected, repeat with 10 more squeezes and follow Step 11 one last time; <b>EXCEPT</b> this time note "30" for the taste threshold <b>IF</b> a sweet taste is reported.</li> </ul> <p>13. If <b>NO</b> sweet taste is reported after 30 squeezes, you must <b>STOP</b> and choose a different fit-test protocol for the employee.</p>
<b>Test</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• Periodically check nebulizers to make sure they do not clog during use. A test is <b>NOT</b> valid if the nebulizer is clogged at the end of the test.</li> </ul> <p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure (hood).</p> <p>15. Instruct the employee to immediately report if a sweet taste is detected.</p> <p>16. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> <li>• Replenish the aerosol in the hood <b>EVERY</b> 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15</li> <li>• The employee must report if a sweet taste is detected:             <ul style="list-style-type: none"> <li>– If <b>NO</b> saccharin is tasted, the test has been <b>PASSED</b> <ul style="list-style-type: none"> <li>■ If saccharin is tasted the test has <b>FAILED</b>, have the employee select another respirator <b>AND</b></li> <li>■ Repeat screening and testing.</li> </ul> </li> </ul> </li> </ul>

**Table 14**

<b>Bitrex™ Aerosol Test Procedure</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> </ul>

<b>Bitrex™ Aerosol Test Procedure</b>
<ul style="list-style-type: none"> <li>• Bitrex™ (denatonium benzoate) is routinely used as a taste aversion agent in household liquids that children should not drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers</li> <li>• The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the fit test.</li> </ul>
<b>Screening Preparations</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• Taste threshold screening determines whether the employee being tested can detect the taste of Bitrex™</li> <li>• Nebulizers must be thoroughly rinsed in water and shaken dry:             <ul style="list-style-type: none"> <li>– Each morning and afternoon</li> <li><b>OR</b></li> <li>– At least every four hours.</li> </ul> </li> <li>• You may use commercially prepared solutions if they meet the requirements in this procedure.</li> </ul> <p>1. Obtain a test enclosure that meets the following specifications:</p> <ul style="list-style-type: none"> <li>• Twelve inches in diameter by fourteen inches tall</li> <li>• A clear front portion</li> <li>• Enough space inside the front to allow free movement of the head when a respirator is worn</li> <li>• 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications</li> <li>• This enclosure can also be used for testing.</li> </ul> <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers <b>OR</b> equivalent:</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> <li>• Make up a 5% salt solution by dissolving 5.0 grams of salt (sodium chloride) into 100 ml of distilled water</li> <li>• Dissolve 13.5 milligrams of Bitrex™ in the salt solution.</li> </ul> <p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one to be used for fit testing.</li> </ul>
<b>Test Preparations</b>
<p>5. Prepare the fit test solution.</p> <ul style="list-style-type: none"> <li>• Dissolve 10.0 grams of salt (sodium chloride) into 200 ml of distilled water</li> <li>• Add 337.5 milligrams of Bitrex™ to the warmed salt solution.</li> </ul> <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one used for screening.</li> </ul> <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>

<b>Bitrex™ Aerosol Test Procedure</b>
<b>Screening</b>
<p><b>Important:</b> The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the screening and test</p> <p>8. Have the employee, while <b>NOT</b> wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breathe through a slightly opened mouth with tongue extended during screening <b>AND</b> testing</li> <li>• Immediately report when a bitter taste is detected.</li> </ul> <p>10. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer Bitrex™ as follows:</p> <ul style="list-style-type: none"> <li>• Direct the nozzle away from the employee's nose and mouth</li> <li>• Complete 10 squeezes in rapid succession</li> <li>• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.</li> </ul> <p>11. Ask the employee whether a bitter taste is detected.</p> <ul style="list-style-type: none"> <li>• If <b>YES</b>, screening is completed. Proceed to conduct testing, Step 14, <b>AFTER</b> you: <ul style="list-style-type: none"> <li>– Ask the employee to remember the taste for reference during the fit test</li> <li>– Note the employee's taste threshold as "10," regardless of the number of squeezes actually completed</li> </ul> </li> <li>• If <b>NO</b>, screening must continue. Proceed to Step 12.</li> </ul> <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; <b>EXCEPT</b> this time note the employee's taste threshold as "20" <b>IF</b> a bitter taste is reported.</p> <ul style="list-style-type: none"> <li>• If a bitter taste is still <b>NOT</b> detected repeat with 10 more squeezes and follow Step 11 one last time; <b>EXCEPT</b> this time note "30" for the taste threshold <b>IF</b> a bitter taste is reported.</li> </ul> <p>13. If <b>NO</b> bitter taste is reported after 30 squeezes, you must <b>STOP</b> and choose a different fit-test protocol for the employee.</p>
<b>Test</b>
<p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure.</p> <p>15. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breathe through a slightly opened mouth with tongue extended during screening <b>AND</b> testing</li> <li>• Immediately report when a bitter taste is detected.</li> </ul> <p>16. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> <li>• Replenish the aerosol in the hood <b>EVERY</b> 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15</li> <li>• The employee must report if a bitter taste is detected: <ul style="list-style-type: none"> <li>– If <b>NO</b> Bitrex™ is tasted, the test has been <b>PASSED</b></li> <li>– If Bitrex™ is tasted the test has <b>FAILED</b>. Have the employee: <ul style="list-style-type: none"> <li>■ Select another respirator</li> <li><b>AND</b></li> <li>■ Repeat all screening and testing steps.</li> </ul> </li> </ul> </li> </ul>

Table 15

<b>Irritant Smoke (Stannic Chloride) Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• <b>DO NOT USE A TEST ENCLOSURE OR HOOD FOR THIS FIT TEST!</b></li> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• During this test an employee is exposed to irritating smoke containing hydrochloric acid produced by a stannic chloride ventilation smoke tube to detect leakage. The smoke will irritate eyes, lungs, and nasal passages</li> <li>• Employee sensitivity varies, and certain employees may respond more intensely than others exposed to irritant smoke. The individual conducting the fit test must take precautions to minimize the employees' exposure to irritant smoke</li> <li>• Conduct fit testing in an area with adequate ventilation to prevent exposure of the individual conducting the fit test and build-up of irritant smoke in the ambient air.</li> </ul>
<b>Screening AND Test Preparations</b>
<p><b>Important:</b> Sensitivity screening is necessary to determine whether the employee can detect a weak concentration of irritant smoke <b>AND</b> whether any gross facepiece leakage is detected.</p> <ol style="list-style-type: none"> <li>1. Obtain only stannic chloride (ventilation) smoke tubes, <b>AND</b> an aspirator squeeze bulb <b>OR</b> use a low-flow air pump set to deliver 200 milliliters of air flow per minute.</li> <li>2. Equip the employee's chosen respirator with P100 series filters if a negative pressure air-purifying respirator will be tested. If a powered air-purifying respirator (PAPR) will be tested equip the respirator with high-efficiency particulate air (HEPA) filters.</li> </ol>
<b>Screening</b>
<p><b>Important!</b> When performing sensitivity screening checks use only the <b>MINIMUM</b> amount of smoke necessary to elicit a response from the employee.</p> <ol style="list-style-type: none"> <li>3. Advise the employee that the smoke can be irritating to eyes, lungs, and nasal passages <b>AND</b> instruct the employee to keep eyes closed while exposed.</li> <li>4. Break both ends of the ventilation smoke tube <b>AND</b> fit a short piece of plastic tubing, for example, two-to-six inches of tygon tubing, over one end to prevent exposure to the sharp end of the tube. Connect the other end to an aspirator bulb or a low-flow air pump set to deliver a flow of 200 ml per minute.</li> <li>5. While the employee is <b>NOT</b> wearing a respirator, have the employee smell a weak concentration of irritant smoke to become familiar with its irritating properties. <ul style="list-style-type: none"> <li>• Carefully direct a small amount of irritant smoke toward the employee.</li> </ul> </li> </ol>
<b>Test</b>
<ol style="list-style-type: none"> <li>Test 6. Have the employee attach respirator filters, put on, adjust, and seal check the respirator without assistance. The employee must be proficient at these tasks.</li> <li>7. Remind the employee to keep eyes closed during testing.</li> <li>8. Direct a stream of irritant smoke toward the respirator's face seal area as follows:</li> </ol>

<p><b>Irritant Smoke (Stannic Chloride) Test Procedure</b></p> <ul style="list-style-type: none"> <li>• Begin at least 12 inches from the facepiece AND move the smoke around the whole perimeter of the mask</li> <li>• Gradually make two more passes around the perimeter of the facepiece, moving to within 6 inches of the respirator</li> <li>• <b>STOP</b> at any time the employee detects smoke in the facepiece. If this occurs a different respirator will need to be chosen and tested, beginning with sensitivity screening.</li> </ul> <p>9. Have the employee perform appropriate fit-test exercises in Table 19 <b>IF</b> the employee has <b>NOT</b> had an involuntary response such as evidence of coughing, flinching, or other response, <b>OR</b> detected smoke in the facepiece.</p> <ul style="list-style-type: none"> <li>• Continue to direct smoke from a distance of 6 inches around the facepiece perimeter             <ul style="list-style-type: none"> <li>– If smoke is detected at any time the test has <b>FAILED</b>. A different respirator must be chosen and tested, starting with sensitivity screening</li> <li>– If <b>NO</b> smoke is detected proceed to Step 10.</li> </ul> </li> </ul> <p>10. Have the employee remove the respirator <b>AND</b> perform another sensitivity screening check as follows:</p> <ul style="list-style-type: none"> <li>• Continue to use the smoke tube used for fit testing</li> <li>• Carefully direct a <b>SMALL</b> amount of irritant smoke toward the employee             <ul style="list-style-type: none"> <li>– The test has been <b>PASSED IF</b> the employee responds to the smoke</li> <li>– The fit test is <b>VOIDED IF</b> the employee does <b>NOT</b> respond to the smoke.</li> </ul> </li> </ul>
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**Table 16**

<p><b>Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure</b></p>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a quantitative (QNFT) fit-test procedure</li> <li>• This method uses a particle counting instrument that measures and compares the particle concentration both inside and outside the respirator facepiece while the employee performs a series of test exercises</li> <li>• Particles in the ambient air are used as the test aerosol.</li> </ul>
<p><b>Test Preparations</b></p> <p>1. Obtain a test instrument such as a Portacount™.</p> <p>2. Have probed respirators available for each respirator model and size the employer uses, <b>OR</b> have a sampling adapter available if the employee's actual or chosen respirator will be tested.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• A probed respirator has a special fitting installed on the facepiece designed to connect with the end of the test instrument's plastic sampling tube so that air samples can be taken inside the facepiece. Probed respirators can be obtained from the respirator manufacturer, or distributor, <b>AND</b> can only be used for fit-testing purposes</li> <li>• Contact TSI Inc., <b>OR</b> the respirator's manufacturer to obtain probed respirators or facepiece sampling adapters.</li> </ul>

<p>3. Follow the test instrument manufacturer's instructions for test preparation, including particle, zero, and system checks. Make sure the instrument's pass <b>OR</b> fail criterion is programmed to the following <b>MINIMUM</b> performance levels:</p> <ul style="list-style-type: none"> <li>• For half-facepiece respirators, an overall minimum fit factor of 100 as a passing level</li> <li>• For full-facepiece respirators, an overall minimum fit factor of 500 as a passing level</li> </ul> <p>4. Have high-efficiency particulate air (HEPA) filters, <b>OR</b> other respirator filters available that are capable of preventing significant penetration by particles generated by the test instrument such as, P100 or N95 series filters.</p> <ul style="list-style-type: none"> <li>• If you will use a sampling adapter instead of probed respirators be sure to have the correct type for the respirators chosen.</li> </ul>
<p><b>Test</b></p> <p>5. Properly attach the sampling line to the facepiece probe or sampling adapter.</p> <p>6. Have the employee attach respirator filters, put on, properly adjust, and wear the respirator five minutes <b>BEFORE</b> the fit test. During this time you and the employee must evaluate the respirator's general fit by checking:</p> <ul style="list-style-type: none"> <li>• Proper chin placement</li> <li>• Properly tightened straps (do <b>NOT</b> over tighten)</li> <li>• Acceptable fit across the nose bridge</li> <li>• Respirator size. It must span the distance from nose to chin</li> <li>• To see if the respirator stays in position.</li> </ul> <p><b>Note:</b> Wearing the respirator for five minutes permits the employee to make certain the respirator is comfortable <b>AND</b> allows for purging of ambient particles trapped inside the facepiece.</p> <p>7. Have the employee perform a seal check. Make sure the sampling line is crimped to avoid leakage during the seal check. If <b>NO</b> leakage is detected, proceed to Step 8. If leakage is detected:</p> <ul style="list-style-type: none"> <li>• Determine the cause</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>• If leakage is due to a poorly fitting facepiece, have the employee:             <ul style="list-style-type: none"> <li>– Choose another respirator size or model</li> </ul> </li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>– Start again at Step 6.</li> </ul> <p>8. Start the fit test cycle.</p> <ul style="list-style-type: none"> <li>• Follow the manufacturer's instructions for operating the test instrument</li> <li>• Have the employee perform the appropriate fit-test exercises in Table 19             <ul style="list-style-type: none"> <li>– The test instrument will automatically stop and calculate the overall fit factor. Use this result to determine whether or not the test is passed                 <ul style="list-style-type: none"> <li>■ The test has been <b>PASSED</b> if the overall fit factor is at least 100 for a half facepiece, <b>OR</b> 500 for a full facepiece</li> <li>■ The test has <b>FAILED</b> if the overall fit factor is below 100 for a half facepiece or 500 for a full facepiece.</li> </ul> </li> </ul> </li> </ul>

**Note:**

If the test has failed, have the employee select another respirator model or size following Table 11 **AND** repeat this procedure.

**Table 17**

<b>Controlled Negative Pressure (CNP) Test Procedure</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• This is a quantitative fit-test (QNFT) procedure</li> <li>• This method determines respirator fit by measuring how much the facepiece leaks when it is subject to a slight negative pressure <b>AFTER</b> various premeasurement activities</li> <li>• Measurements occur while employees remain still <b>AND</b> hold their breath for 10 seconds</li> <li>• No test aerosols are used. Respirator cartridges are not needed for this test.</li> </ul>
<b>Test Preparations</b>
<ol style="list-style-type: none"> <li>1. Make sure the individual conducting the fit test is thoroughly trained to perform this test.</li> <li>2. Obtain a CNP test instrument such as a FitTester 3000™. Make sure: <ul style="list-style-type: none"> <li>• Defaults are set at: <ul style="list-style-type: none"> <li>– -15mm (-0.58 inches) of water test pressure</li> </ul> </li> <li><b>AND</b></li> <li>– A modeled inspiratory flow rate of 53.8 liters per minute</li> <li>• It has an effective audio warning device that signals when employees fail to hold their breath.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• You are not required to obtain test recording and printing equipment such as computers <b>OR</b> printers. Hand recording results is acceptable</li> <li>• To see default settings, check the instrument's "REDON protocol."</li> </ul> </li> <li>3. Obtain facepiece adapters appropriate for each test respirator. <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Adapters are either a one-piece (for SCBA facepieces), <b>OR</b> two-piece (for dual cartridge facepieces) device providing a manifold and breathing valve system. For positive pressure respirators, you will need to</li> </ul> </li> </ol>

**Controlled Negative Pressure (CNP) Test Procedure**

obtain an additional fitting, available from the respirator manufacturer, to convert the facepiece to negative pressure

- To obtain adapters, contact the CNP instrument's distributor, Occupational Health Dynamics, **OR** the respirator manufacturer.

**Test****Important!**

After the test, you must ask the employee about the comfort of the respirator **AND** if the respirator has become unacceptable, another size or model must be chosen and tested.

4. Explain the test procedure to the employee.
5. Train the employee on how to hold a breath for at least 20 seconds.
6. Prepare the respirator for the fit test as follows:
  - Remove or prop open the inhalation valves. If a breathing tube is present, disconnect it
  - Replace cartridges, if present, with the manifold and breathing valve adapter
    - For positive pressure facepieces, mount the manufacturer's additional fitting followed by the manifold-breathing valve adapter
  - Connect the respirator to the CNP device according to the CNP instrument manufacturer's directions.
7. Have the employee put on, adjust, and seal check the respirator.
8. Turn on the instrument **AND** have the employee stand and perform the fit-test exercises in Table 19.
9. Interpret the test results:
  - The test is **PASSED IF** the overall fit factor obtained is at least 100 for a half facepiece, or at least 500 for a full facepiece
  - The test has **FAILED IF** the fit factor is less than 100 for a half facepiece; 500 for a full facepiece
    - If the test has **FAILED** you must have the employee select another respirator model or size following the steps in Table 11 **AND** repeat this procedure, starting at Step 6.

**Table 18**

<b>Generated Aerosol Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a quantitative (QNFT) fit-test procedure</li> <li>• In this method, a test aerosol is used to challenge the facepiece seal while aerosol concentrations inside and outside the facepiece are measured during test exercises</li> <li>• Special equipment is needed to generate, disperse, detect, and measure test aerosols.</li> </ul>
<b>Test Preparations</b>
<ol style="list-style-type: none"> <li>1. Test aerosol. <ul style="list-style-type: none"> <li>• Use a particulate, for example, corn oil, polyethylene glycol 400, di-2-ethyl hexyl sebacate, or sodium chloride.</li> </ul> </li> <li>2. Instrumentation. <ul style="list-style-type: none"> <li>• Do <b>ALL</b> the following: <ul style="list-style-type: none"> <li>– Obtain and use aerosol generation, dilution, and measurement systems appropriate for particulates</li> <li>– Use an aerosol-generating instrument that will maintain test concentrations within a 10% variation</li> <li>– Select a sampling instrument that allows for a computer record or strip chart record to be created</li> </ul> </li> </ul> </li> </ol>

### Generated Aerosol Test Procedure

■ The record must show the rise and fall of test agent concentration during each inhalation and exhalation at fit factors of at least 2000.

**Note:** Integrators, or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise, may be used if a record of the readings is made.

– Minimize the time interval between the activity and the recording of the activity so you can clearly connect what you see to what is being recorded. For example, use a small diameter and length of sampling line.

#### 3. Test enclosure.

• Do **ALL** the following:

– Make sure the enclosure is equipped and constructed to effectively:

■ Maintain a uniform concentration of the test agent inside the enclosure. For example, the enclosure must be large enough to allow **ALL** employees freedom of movement during testing **WITHOUT** disturbing the test concentration or measurement instrument

■ Keep the test agent from contaminating the air outside the enclosure. For example, use a HEPA filter to purify exhausted air

■ Allow the individual conducting the fit test to view the employee during the test

– Make sure the tubing used to collect samples from the enclosure **AND** respirator is the same material, diameter, **AND** length. This makes the effect of aerosol loss caused by deposition in each sample line equal

– If sodium chloride is used, relative humidity inside the enclosure must be kept below 50%.

#### 4. Prepare test respirators.

• Do **ALL** the following:

– Inspect test respirators regularly for missing parts **AND** damage

– Keep test respirators in proper working order

– Make sure in-mask sampling probes are:

■ Designed and installed so the air sample will be drawn from the employee's breathing zone; midway between the nose and mouth

**AND**

■ The probe extends inside the facepiece at least 1/4 inch

– Make sure sampling ports such as probes, or adapters on respirators are constructed and installed so they do **NOT**:

■ Block air flow into the sampling line

■ Leak

■ Interfere with the respirator's fit or performance

• Have high efficiency particulate air (HEPA) filters **OR** P100 series filter available

– Replace filters when increased breathing resistance is detected **OR** when the test agent has altered the filter material's integrity.

### Test

#### **Important!**

• Throughout the test, maintain the employee's exposure to any test agent below the established exposure limit. Exposures allowed must be based on exposure time and exposure limit duration

• If a single peak penetration exceeds 5% for half facepieces **OR** 1% for full facepieces:

– **STOP** the test

**AND**

– Have the employee select another respirator for testing.

#### 5. Have the employee attach filters, put on, adjust, and seal check the respirator.

• Be sure to crimp the sampling line to avoid pressure leaks during the seal check

**AND**

• Have the employee adjust the respirator straps, without assistance, so the fit is comfortable. Do **NOT** over tighten.

#### 6. **OPTIONAL Step.** To save time conduct a screening test to quickly identify poorly fitting respirators.

**Note:**

You may use a qualitative screening test **OR** an ambient aerosol condensation nuclei counter instrument in the count mode.

#### 7. Make sure test aerosol concentration is reasonably stable.

• If a canopy or shower curtain enclosure is used, determine stability of the test aerosol concentration **AFTER** the employee enters the enclosure.

#### 8. Have the employee enter the test enclosure and connect the respirator to the sample lines.

#### 9. Immediately after entering the enclosure measure test aerosol concentration inside the respirator.

• Make sure the peak penetration does **NOT** exceed 5% for half facepieces, **OR** 1% for full facepieces.

#### 10. Have employee perform the appropriate fit-test exercises in Table 19.

• Do **NOT** adjust the respirator once exercises begin.

#### 11. Calculate the overall fit factor as specified in Steps 12-13. The fit test is:

• **PASSED IF** the minimum fit factor of 100 for half facepieces **OR** 500 for full facepieces is obtained

## Generated Aerosol Test Procedure

**OR**

- If a passing fit factor is **NOT** obtained, the test has **FAILED** and you must have the employee select and test another respirator.

**Calculations****Important!**

- Do **NOT** count the grimace exercise measurements during these calculations
- Take into account the limitations of instrument detection when determining fit factors.

12. Calculate individual fit factors for **EACH** exercise by applying the following:

Exercise fit factor (ffE) =  $\frac{\text{Average test enclosure concentration}}{\text{Test aerosol concentration inside the respirator}}$

Test aerosol concentration inside the respirator

- To determine the average test enclosure concentration use one of the following methods:
  - Arithmetic average of the concentration before and after each **test** (an average of two values per entire test)
  - Arithmetic average of concentration before and after each **exercise** (an average of two values per exercise)
  - True average measured continuously during the respirator sample
- Determine the test aerosol concentration inside the respirator in one of the following ways:
  - Average peak penetration values. Determine aerosol penetration for each exercise by:
    - Using integrators or computers that calculate the actual test agent penetration
  - OR**
  - Average the peak heights shown on the strip chart recording, graph, or by computer integration
    - Maximum peak penetration. Use strip chart recordings to determine the highest peak penetration for each exercise and use this value
    - Area under the peaks. Use computerized integration or other appropriate calculations to integrate the area under individual peaks for each exercise.

13. Using individual exercise fit factors (ffE) calculate the **overall fit factor** by doing **ALL** of the following:

- Convert each exercise fit factor to a penetration value
- Determine the average penetration value
- Convert the average penetration value back to a fit factor

**OR**

Use this equation to calculate the **overall fit factor**:

$$\text{Overall fit factor} = \frac{n}{1/\text{ffE}_1 + 1/\text{ffE}_2 + 1/\text{ffE}_3 \dots + 1/\text{ffE}_n}$$

**Table 19****Fit-Test Exercises****Important:**

- This list applies when you use any fit test
- Employees tested must perform **ALL** exercises marked with an "X" as described for the fit-test procedure used
  - Once exercises begin, any adjustments made void the test **AND** you must begin again
  - After test exercises are completed, you must ask the employee about the comfort of the respirator. If it has become unacceptable, have the employee choose another one for testing
- When the controlled negative pressure procedure is used, **STOP and repeat** the test if the employee adjusts the respirator **OR** takes a breath and fails to hold it for 10 seconds
- Controlled negative pressure tests conducted according to the method published in 29 CFR 1910.134, Appendix A are an acceptable alternative to the method outlined below.

Description of Required Fit-Test Exercises	Fit-Test Procedures		
	Qualitative Procedures	Quantitative Procedures; <b>EXCEPT</b> the <b>CNPP</b>	Controlled Negative Pressure Procedure (CNPP)
• Normal breathing <ul style="list-style-type: none"> <li>– Breathe normally, while standing for one minute</li> </ul>	X	X	
• Deep breathing <ul style="list-style-type: none"> <li>– Breathe slowly and deeply while standing for one minute</li> <li>– Take caution to avoid hyperventilating</li> </ul>	X	X	
• Head side to side			

Fit-Test Exercises			
<ul style="list-style-type: none"> <li>– Slowly turn head from side to side while standing for one minute, pausing at each extreme position to inhale</li> <li>– Be careful to <b>NOT</b> bump the respirator</li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Head up and down               <ul style="list-style-type: none"> <li>– Slowly move head up and down while standing for one minute, inhaling in the up position</li> <li>– Be careful to <b>NOT</b> bump the respirator</li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Talking               <ul style="list-style-type: none"> <li>– Talk slowly and loud enough to be heard clearly by the individual conducting fit testing for one minute. Choose <b>ONE</b> of the following:                   <ul style="list-style-type: none"> <li>■ Read from a prepared text such as the Rainbow Passage<sup>1</sup></li> <li>■ Count backward from 100</li> <li>■ Recite a memorized poem or song.</li> </ul> </li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Grimace               <ul style="list-style-type: none"> <li>– Smile or frown for fifteen seconds.</li> </ul> </li> </ul>		X	
<ul style="list-style-type: none"> <li>• Bending over               <ul style="list-style-type: none"> <li>– Bend over to touch toes while standing. Repeat at a comfortable pace for one minute</li> <li><b>OR</b></li> <li>– Jog in place for one minute if the test enclosure, such as a hood, does not permit bending over</li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Normal breathing               <ul style="list-style-type: none"> <li>– Breathe normally while standing for one minute</li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Face forward               <ul style="list-style-type: none"> <li>– <b>Premeasurement activity:</b> Stand and breath normally, without talking</li> <li>– <b>Measurement position:</b> Face forward while holding breath for 10 seconds</li> </ul> </li> </ul>			X
<ul style="list-style-type: none"> <li>• Bending over               <ul style="list-style-type: none"> <li>– <b>Premeasurement activity:</b> While standing, bend over to touch toes</li> <li>– <b>Measurement position:</b> Hold the bending position with face parallel to the floor while holding breath for 10 seconds</li> </ul> </li> </ul>			X
<ul style="list-style-type: none"> <li>• Head shaking               <ul style="list-style-type: none"> <li>– <b>Premeasurement activity:</b> Vigorously shake head from side to side for 3 seconds while shouting or making the sound of "BRRRR" loudly</li> <li>– <b>Measurement position:</b> Face forward, while holding breath for 10 seconds</li> </ul> </li> </ul>			X
<ul style="list-style-type: none"> <li>• Redon-1               <ul style="list-style-type: none"> <li>– <b>Premeasurement activity:</b> Remove the respirator completely and put it back on</li> <li>– <b>Measurement position:</b> Face forward while holding breath for 10 seconds</li> </ul> </li> </ul>			X
<ul style="list-style-type: none"> <li>• Redon-2               <ul style="list-style-type: none"> <li>– Repeat the premeasurement activity and measurement position described in Redon-1</li> </ul> </li> </ul>			X

<sup>1</sup>The Rainbow Passage:

"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-22010, filed 10/1/03, effective 1/1/04.]

**WAC 296-842-22015 Follow procedures established for cleaning and disinfecting respirators.****You must:**

- Follow the procedure in Table 20 for cleaning and disinfecting respirators.

**Table 20  
Respirator Cleaning Procedure**

Step	Task
1.	Remove filters, cartridges, canisters, speaking diaphragms, demand and pressure valve assemblies, hoses, or any components recommended by the manufacturer. <ul style="list-style-type: none"> <li>• Discard or repair any defective parts.</li> </ul>
2.	Wash components in warm (43°C [110°F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer <ul style="list-style-type: none"> <li>• A stiff bristle (not wire) brush may be used to help remove the dirt</li> <li>• If the detergent or cleaner does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:               <ul style="list-style-type: none"> <li>– A bleach solution (concentration of 50 parts per million of chlorine). Make this by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F)</li> <li>– A solution of iodine (50 parts per million iodine). Make this in two steps:                   <ul style="list-style-type: none"> <li>■ First, make a tincture of iodine by adding 6-8 grams of solid ammonium iodide and/or potassium iodide to 100 cc of 45% alcohol approximately</li> <li>■ Second, add 0.8 milliliters of the tincture to one liter of water at 43°C (110°F) to get the final solution</li> </ul> </li> <li>– Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.</li> </ul> </li> </ul>
3.	Rinse components thoroughly in clean, warm (43°C [110°F] maximum), preferably, running water. <p><b>Note:</b> The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces could cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts, if not completely removed.</p>
4.	Drain components.
5.	Air-dry components or hand dry components with a clean, lint-free cloth.
6.	Reassemble the facepiece components. <ul style="list-style-type: none"> <li>• Replace filters, cartridges, and canisters, if necessary (for testing).</li> </ul>
7.	Test the respirator to make sure all components work properly.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-22015, filed 10/1/03, effective 1/1/04.]

**Reviser's note:** RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

**WAC 296-842-22020 Follow procedures established for seal checking respirators.****IMPORTANT:**

- User seal checks are **NOT** a substitute for fit tests. See WAC 296-842-22010 for fit test procedures.
- You may use a seal check procedure recommended by the respirator manufacturer **INSTEAD** of the procedure outlined in Table 21 if you can demonstrate the procedure is based on a scientific study that, for example, demonstrates the procedure effectively identifies respirators that fit poorly when put on or adjusted.

**You must:**

- Make sure employees perform a user seal check as outlined in Table 21, **EACH TIME** the respirator is worn, to make sure the seal is adequate.

**Table 21****User Seal Check Procedure****Important information for employees:**

- You need to conduct a seal check **each time** you put your respirator on **BEFORE** you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit tested by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems
- The procedure below has two parts; a positive pressure check and a negative pressure check. **You must complete both parts each time.** It should only take a few seconds to perform, once you learn it
  - ◆ If you cannot pass both parts, your respirator is **NOT** functioning properly, see your supervisor for further instruction.

**Positive pressure check:**

1. Remove exhalation valve cover, if removable.
2. Cover the exhalation valve completely with the palm of your hand **WHILE** exhaling gently to inflate the facepiece slightly.

<b>User Seal Check Procedure</b>
<p>3. The respirator facepiece should remain inflated (indicating a build-up of positive pressure and <b>NO</b> outward leakage).</p> <ul style="list-style-type: none"> <li>• If you detect <b>NO</b> leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check</li> <li>• If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.</li> </ul>
<p><b>Negative pressure check:</b></p> <p>4. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands <b>WHILE</b> inhaling gently to collapse the facepiece slightly.</p> <ul style="list-style-type: none"> <li>• If you cannot use the palm(s) of your hands to effectively cover the inhalation openings on cartridges or canisters, you may use: <ul style="list-style-type: none"> <li>– Filter seal(s) (if available)</li> <li><b>OR</b></li> <li>– Thin rubber gloves.</li> </ul> </li> </ul> <p>5. Once the facepiece is collapsed, hold your breath for 10 seconds <b>WHILE</b> keeping the inhalation openings covered.</p> <p>6. The facepiece should remain slightly collapsed (indicating negative pressure and <b>NO</b> inward leakage).</p> <ul style="list-style-type: none"> <li>• If you detect <b>NO</b> evidence of leakage, the tightness of the facepiece is considered adequate, the procedure is completed, and you may now use the respirator</li> <li>• If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat <b>BOTH</b> the positive and negative fit checks.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-22020, filed 10/1/03, effective 1/1/04.]

### **WAC 296-842-300 Definitions.**

#### **Air-purifying respirator (APR)**

A respirator equipped with an air-purifying element such as a filter, cartridge, or canister, **OR** having a filtering facepiece, for example, a dust mask.

The element or filtering facepiece is designed to remove specific contaminants, such as particles, vapors, or gases, from air that passes through it.

#### **Air-line respirator**

An atmosphere-supplying respirator for which breathing air is drawn from a source separate from and not worn by the user, such as:

- A cylinder or a tank
- A compressor
- An uncontaminated environment.

#### **Air supplied respirator (see air-line respirator)**

#### **Assigned protection factor (APF)**

Indicates the expected level of workplace respiratory protection **WHEN** the respirator is:

- Functioning properly
- AND**
- Fitted to the user
- AND**
- Worn by trained individuals
- AND**
- Used with the limitations specified on the NIOSH approval label.

approval label.

[Title 296 WAC—p. 2974]

#### **Atmosphere-supplying respirator**

A respirator that supplies the user with breathing air from sources, such as:

- A cylinder or a tank
- A compressor
- An uncontaminated environment.

#### **Breathing air**

Air supplied to an atmosphere-supplying respirator. This air meets the specifications found in WAC 296-842-200.

#### **Canister or cartridge (air-purifying)**

Part of an air-purifying respirator that consists of a container holding materials such as fiber, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

#### **Cartridge respirator (see also air-purifying respirator)**

An air-purifying respirator equipped with one or more cartridges. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

#### **Demand respirator**

An atmosphere-supplying respirator that sends breathing air to the facepiece only when suction (negative pressure) is created inside the facepiece by inhalation. Demand respirators are "**negative pressure**" respirators.

#### **Dust mask**

A name used to refer to filtering-facepiece respirators. Dust masks may or may not be NIOSH certified. See filtering facepiece.

#### **Emergency respirator**

Respirators suitable for rescue, escape, or other activities during emergency situations.

#### **Emergency situation**

Any occurrence that could **OR** does result in a significant uncontrolled release of an airborne contaminant. Causes of emergency situations include, but are not limited to, equipment failure, rupture of containers, or failure of control equipment.

#### **End-of-service-life indicator (ESLI)**

A system that warns the air-purifying respirator user that cartridges or canisters must be changed. An example of an ESLI is a dot on the respirator cartridge that changes color.

#### **Escape-only respirator**

A respirator that can only be used to exit during emergencies. Look for this use limitation on the respirator's NIOSH approval label.

#### **Exposed, or exposure**

The contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

#### **Filter**

Fibrous material that removes dust, spray, mist, fume, fog, smoke particles, **OR** other aerosols from the air.

#### **Filtering-facepiece respirator**

A tight-fitting, half-facepiece, negative-pressure, particulate air-purifying respirator with the facepiece **MAINLY** composed of filter material. These respirators do not use cartridges or canisters and may have sealing surfaces composed of rubber, silicone or other plastic-like materials. They are sometimes referred to as "dust masks."

**Fit factor**

A number providing an estimate of fit for a particular respiratory inlet covering to a specific individual during quantitative fit testing.

**Fit test** (see also qualitative fit test and quantitative fit test)

Fit testing is an activity where the facepiece seal of a respirator is challenged, using a WISHA accepted procedure, to determine if the respirator provides an adequate seal.

**Full-facepiece respirator**

A tight-fitting respirator that covers the wearer's nose, mouth, and eyes.

**Gas mask**

An air-purifying respirator equipped with one or more canisters. These respirators have a facepiece made from silicone, rubber OR other plastic-like materials.

**Half-facepiece respirator**

A tight-fitting respirator that only covers the wearer's nose and mouth.

**Helmet**

The rigid part of a respirator that covers the wearer's head AND also provides head protection against impact or penetration.

**High-efficiency particulate air filter (HEPA)**

A powered air purifying respirator (PAPR) filter that removes at least 99.97% of monodisperse dioctyl phthalate (DOP) particles with a mean particle diameter of 0.3 micrometer from contaminated air.

**Note:** Filters designated, under 42 CFR Part 84, as an "N100," "R100," or "P100" provide the same filter efficiency (99.97%) as HEPA filters.

**Hood**

The part of a respirator that completely covers the wearer's head and neck AND may also cover some or all of the shoulders and torso.

**Immediately dangerous to life or health (IDLH)**

An atmospheric condition that would:

- Cause an immediate threat to life

**OR**

- Cause permanent or delayed adverse health effects

**OR**

- Interfere with an employee's ability to escape.

**Licensed health care professional (LHCP)**

An individual whose legally permitted scope of medical practice allows him or her to provide **SOME OR ALL** of the health care services required for respirator users' medical evaluations.

**Loose-fitting facepiece**

A respiratory inlet covering that is designed to form a partial seal with the face.

**Negative-pressure respirator**

Any tight-fitting respirator in which the air pressure inside the facepiece is less than the air pressure outside the respirator during inhalation.

**NIOSH**

The National Institute for Occupational Safety and Health. NIOSH is the federal agency that certifies respirators for occupational use.

**Oxygen deficient**

An atmosphere with an oxygen content below 19.5% by volume.

(2007 Ed.)

**Permissible exposure limit (PEL)**

Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA chapters.

**Positive-pressure respirator**

A respirator in which the air pressure inside the respiratory-inlet covering is greater than the air pressure outside the respirator.

**Powered air-purifying respirators (PAPRs)**

An air-purifying respirator equipped with a blower that draws ambient air through cartridges or canisters. These respirators, as a group, are **NOT** classified as positive pressure respirators and must not be used as such.

**Pressure-demand respirator**

A positive-pressure atmosphere-supplying respirator that sends breathing air to the respiratory inlet covering when the positive pressure is reduced inside the facepiece by inhalation or leakage.

**Qualitative fit test (QLFT)**

A test that determines the adequacy of respirator fit for an individual. The test relies on the employee's ability to detect a test substance. Test results are either "pass" or "fail."

**Quantitative fit test (QNFT)**

A test that determines the adequacy of respirator fit for an individual. The test relies on specialized equipment that performs numeric measurements of leakage into the respiratory inlet covering. Test results are used to calculate a "fit factor."

**Respiratory hazard**

Harmful airborne hazards and oxygen deficiency that are addressed in chapter 296-841 WAC, Respiratory hazards.

**Required use**

Respirator use:

- That is necessary to protect employees from respiratory hazards

**OR**

- That the employer decides to require for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits

**Respirator**

A type of personal protective equipment designed to protect the wearer from harmful airborne hazards, oxygen deficiency, or both.

**Respiratory inlet covering**

The part of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source or both. The respiratory inlet covering may be a facepiece, helmet, hood, suit, or mouthpiece respirator with nose clamp.

**Seal check**

Actions conducted by the respirator user each time the respirator is put on, to determine if the respirator is properly seated on the face.

**Self-contained breathing apparatus (SCBA)**

An atmosphere-supplying respirator designed for the breathing air source, to be carried by the user.

**Service-life**

The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer. For example, the period of time that sorbent car-

tridge is effective for removing a harmful substance from the air.

#### **Sorbent**

Rigid, porous material, such as charcoal, used to remove vapor or gas from the air.

#### **Supplied-air respirator (see air-line respirator)**

#### **Tight-fitting facepiece**

A respiratory inlet covering forming a complete seal with the face OR neck. Mouthpiece respirators are not tight-fitting facepieces.

#### **Voluntary use**

Respirator use that is requested by the employee AND permitted by the employer when NO respiratory hazard exists.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 03-20-114, § 296-842-300, filed 10/1/03, effective 1/1/04.]

### **Chapter 296-843 WAC**

#### **HAZARDOUS WASTE OPERATIONS**

#### **WAC**

296-843-100	Scope.
296-843-110	Evaluations and inspections.
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296-843-120	Health and safety plan (HASP).
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296-843-13005	Conduct monitoring for health and safety hazards during initial site entry.
296-843-13010	Evaluate employee exposure to hazardous substances during clean-up operations.
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296-843-14005	Establish site control.
296-843-150	Worker and equipment decontamination.
296-843-15005	Establish and implement decontamination procedures before any worker or equipment enters a contaminated area.
296-843-15010	Provide showers and changing rooms.
296-843-15015	Provide washing facilities.
296-843-160	Emergency response for hazardous waste sites.
296-843-16005	Establish an emergency response plan for anticipated emergencies before beginning hazardous waste operations.
296-843-170	Employee exposure controls.
296-843-17005	Control employee exposure to site health and safety hazards.
296-843-180	Drum and container handling.
296-843-18005	Handle drums and containers safely.
296-843-18010	Handle drums and containers suspected of containing shock-sensitive (explosive) wastes safely.
296-843-18015	Maintain worker safety in drum and container opening areas.
296-843-18020	Ship and transport drums and containers safely.
296-843-190	Personal protective equipment (PPE).
296-843-19005	Provide and use appropriate PPE.
296-843-200	Training, briefings, and information.
296-843-20005	Inform workers, contractors and subcontractors about the hazardous waste site.
296-843-20010	Train workers, supervisors and managers before work begins on the site.
296-843-20015	Provide additional training to your managers and supervisors.
296-843-20020	Training for postemergency response.
296-843-20025	Make sure your employees receive written documentation of training.
296-843-20030	Provide refresher training to employees.
296-843-20035	Use qualified trainers.
296-843-210	Medical surveillance.
296-843-21005	Provide medical surveillance for your employees.
296-843-220	Recordkeeping and information access.
296-843-22005	Make your records accessible.
296-843-22010	Keep medical surveillance records for your employees.
296-843-300	Definitions.

**WAC 296-843-100 Scope.** This chapter applies if you have any of the following:

- Employees working in operations involving hazardous waste at a treatment, storage, and disposal (TSD) facility required to have a permit or interim status AND regulated by any of the following:

- 40 CFR Parts 264 and 265 under the Resource Conservation and Recovery Act of 1976 (RCRA), 42 U.S.C. 6901 et seq.;

- Agencies implementing RCRA through agreements with the United States Environmental Protection Agency (U.S.E.P.A.);

- Chapter 173-303 WAC, Dangerous waste regulations;

**OR**

- Employees conducting initial investigations of government-identified sites before determining whether hazardous substances are present;

**OR**

- Corrective actions, involving clean-up operations, at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq.) or chapter 70.105 RCW, Hazardous waste management;

**OR**

- Employees performing clean-up operations at an uncontrolled hazardous waste site. Sites include, but are not limited to:

- The Environmental Protection Agency's (EPA) National Priority Site List (NPL); see <http://www.epa.gov/superfund/sites/npl/wa.htm>;

- Sites recommended for inclusion on the EPA NPL;

- State priority site lists, for example those listed under chapter 173-340 WAC, Model Toxics Control Act (MTCA); see <http://www.ecy.wa.gov/programs/tcp/cscs/CSCSpage.HTM>;

- Unlisted sites recognized by a federal, state or local government as an uncontrolled hazardous waste site. Examples of such sites include:

- Sites that do not meet clean-up goals established by the MTCA and that pose a threat or potential threat to human health or the environment;

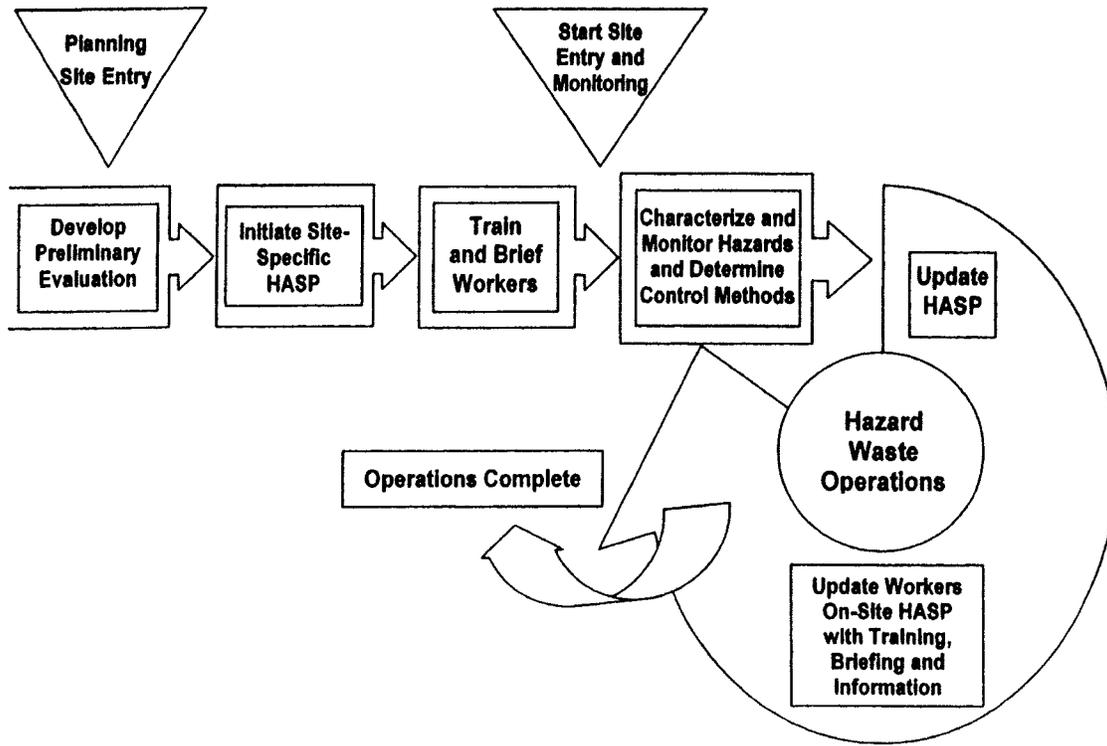
- Clandestine drug lab sites designated for cleanup;

- Postemergency response cleanup at the site of a hazardous substance release regulated by chapter 296-824 WAC, Emergency response.

#### **IMPORTANT:**

This chapter applies to hazardous waste sites until cleanup at the site is determined to be complete by the governing regulatory agency.

**Site Evaluation Health & Safety Plan  
(HASP) Development Cycle**



**IMPORTANT:** This diagram is to illustrate the general flow of the site. Please see the body of the regulation for details.

Illustration 1

**Other rules that may apply to hazardous waste operations:**

You will find safety and health requirements (for example, personal protective equipment) are addressed in other rules and also in this chapter. If you find a conflict in requirements, you need to meet the more protective requirement. Contact your local L&I office if you need assistance in making this determination.

Examples of other rules that may apply:

- Chapter 296-800 WAC, Safety and health core rules:
  - WAC 296-800-140, Accident prevention program;
  - WAC 296-800-210, Lighting;
  - WAC 296-800-230, Drinking water, bathrooms, washing facilities and waste disposal.
- Chapter 296-24 WAC, Safety standards for general safety.
- Chapter 296-833 WAC, Temporary housing for workers.
- Chapter 296-62 WAC, General occupational health.

- Chapter 296-155 WAC, Safety standards for construction work.
- Chapter 296-824 WAC, Emergency response.
- Chapter 296-841 WAC, Respiratory hazards.
- Chapter 296-842 WAC, Respirators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-100, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-110 Evaluations and inspections.**

**Your responsibility:**

To conduct evaluations before entering the site and periodically throughout the hazardous waste operations.

**You must:**

- Complete a preliminary site evaluation before allowing employees to enter the site  
WAC 296-843-11005.
- Conduct ongoing evaluations of safety and health hazards  
WAC 296-843-11010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-110, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-11005 Complete a preliminary site evaluation before allowing employees to enter the site.**

**You must:**

- Complete a preliminary site evaluation by doing all the following:

Collect or develop the following information to the extent available:	<ul style="list-style-type: none"> <li>• The site location and approximate size</li> <li>• A description of the response activity and the job tasks to be performed</li> <li>• The time needed to cover all planned activities</li> <li>• The site's topography and all ways to access the site</li> <li>• The current status and capabilities of any emergency response team assisting during an emergency</li> <li>• The safety and health hazards expected at the site</li> <li>• The hazardous substances and health hazards at the site, including their chemical and physical properties</li> <li>• All hazardous substance dispersion pathways</li> <li>• An emergency response plan</li> </ul>
Have a qualified person evaluate the preliminary site information to identify:	<ul style="list-style-type: none"> <li>• Potential site hazards and risks</li> <li>• The most appropriate methods to protect employees</li> <li>• Conditions that have the potential to cause death or serious harm, including potential inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH)                         <ul style="list-style-type: none"> <li>– Examples include:                                 <ul style="list-style-type: none"> <li>■ Confined space entry</li> <li>■ Potentially explosive or flammable environments</li> <li>■ Visible vapor clouds</li> <li>■ Areas where plants or animals have died</li> </ul> </li> </ul> </li> <li>• Risks related to specific on-site hazardous substances and health hazards                         <ul style="list-style-type: none"> <li>– Examples include:                                 <ul style="list-style-type: none"> <li>■ Exposures exceeding the permissible exposure limits (PELs) or published exposure levels</li> <li>■ IDLH concentrations</li> <li>■ Potential skin absorption and irritation sources</li> <li>■ Potential eye irritation sources</li> <li>■ Explosion sensitivity and flammability ranges</li> <li>■ Oxygen deficient atmospheres</li> </ul> </li> </ul> </li> </ul>
Have a qualified person prepare an initial site characterization and analysis for the site to:	<ul style="list-style-type: none"> <li>• Identify known and suspected health and safety hazards for the site</li> <li>• Aid in selecting control methods to protect employees from site hazards</li> <li>• Brief employees on site conditions before any work starts</li> <li>• Initiate the site-specific health and safety plan (HASP)</li> </ul>

**Note:** Characterization and analysis of site hazards is an ongoing process for work on the hazardous waste site.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-11005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-11010 Conduct ongoing evaluations of safety and health hazards.**

**You must:**

- (1) Have a qualified person complete further evaluation of health and safety hazards at the site immediately after initial entry to:

[Title 296 WAC—p. 2978]

- Identify site hazards in more detail.
- Help select appropriate:
  - Control methods to protect employees from site hazards.
  - Personal protective equipment (PPE) for site operations.

**Note:** For more information, see WAC 296-843-170, Hazard controls, and WAC 296-843-190, Personal protective equipment.

**You must:**

- (2) Make sure your site safety and health supervisor or another qualified person performs periodic inspections to:
  - Determine if the site-specific HASP is effective.
  - Correct any deficiencies.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-11010, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-120 Health and safety plan (HASP).**

**Your responsibility:**

To establish a written health and safety plan (HASP).

**You must:**

- Develop and maintain a written site-specific health and safety plan (HASP) WAC 296-843-12005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-120, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-12005 Develop and maintain a written site-specific health and safety plan (HASP).**

**Reference:**

If your overall program required under WAC 296-800-140, Accident prevention program (APP), meets requirements of this chapter, you do not need to duplicate those portions of your APP in the site-specific health and safety plan (HASP).

**You must:**

- Develop a written HASP for each hazardous waste site, **BEFORE** beginning hazardous waste operations, that includes at least the following:

**Hazard analysis:**

- Identification and evaluation of on-site safety and health hazards.
- A safety and health risk (hazard) analysis for each site task and operation that is identified in the comprehensive work plan.

**Organization chart:**

- An organizational structure that reflects current site operations, including the following:
  - Establish and identify the chain of command.
  - Identify the site safety and health supervisor and other personnel responsible for employee safety and health.
  - Specify the overall responsibilities of supervisors and employees.
  - Include the name and title of the person with responsibility and authority to direct all hazardous waste operations.
  - Include a site safety and health supervisor responsible for developing and implementing the HASP and verifying compliance.
  - Identify the functions and responsibilities of all personnel needed for hazardous waste operations and emergency response.
  - Identify site specific lines of authority, responsibility, and communication.

**Comprehensive work plan:**

– A written comprehensive work plan of tasks, objectives, logistics, and resources for site operations, including the following:

- Addresses anticipated clean-up activities and normal operating procedures unless that information is already available in another document.

- Defines work tasks and objectives.

- Describes how the work tasks and objectives will be accomplished.

- Establishes the personnel requirements to implement the work plan.

- Provides for implementation of training, briefings, and information as required by WAC 296-843-200.

**Site control plan:**

– An up-to-date site control plan before clean-up operations begin to minimize employee exposure to hazardous substances and including the following (unless it's available in another document):

- A site map.

- Establish site work zones.

- How the "buddy system" is used.

- The site communications plan, including how employees are alerted during emergencies.

- The site's standard operating procedures (SOPs) or safe work practices.

- Identification of the nearest medical assistance.

**Personal protective equipment:**

– A PPE plan that addresses all of the following:

- Site hazards and activities.

- Methods to evaluate the effectiveness of the PPE plan.

- Criteria for selecting and fitting PPE, including work duration, use limitations of particular PPE, and medical considerations such as temperature extremes and heat stress.

- Training on PPE use.

- Procedures for putting on and taking off PPE.

- PPE inspection procedures prior to, during, and after use.

- Decontamination and disposal of PPE.

- Maintenance and storage of PPE.

**Additional elements:**

– A sampling and monitoring plan (see WAC 296-843-130) that includes sampling of drums and containers.

– Site control measures (see WAC 296-843-140).

– Decontamination procedures (see WAC 296-843-150).

– Spill containment plans (see WAC 296-843-180, Drum and container handling).

– Standard operating procedures for sampling, managing, and handling drums and containers (see WAC 296-843-180).

– Entry procedures for tanks or vaults (see WAC 296-62-141, Confined spaces).

– A training, briefings, and information plan (see WAC 296-843-200).

– A medical surveillance plan (see WAC 296-843-210), that includes site-specific medical surveillance requirements.

– Sanitation (see WAC 296-155-140).

– Lighting (see WAC 296-800-210).

– Excavations (see chapter 296-155 WAC, Part N, Excavation, trenching and shoring).

– Any relationship or interaction between other programs and the site-specific program.

**Note:** The emergency response plan required by WAC 296-843-160, Emergency response for hazardous waste sites, is also included as a separate section in the HASP.

**You must:**

- Keep a copy of your HASP on site.

**Reference:** For more information, see WAC 296-843-220, Recordkeeping and information access.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-12005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-130 Sampling and monitoring.****Your responsibility:**

To conduct monitoring for health and safety hazards to protect employees.

**You must:**

Conduct monitoring for health and safety hazards during initial site entry

WAC 296-843-13005.

Evaluate employee exposure to hazardous substances during clean-up operations

WAC 296-843-13010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-130, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-13005 Conduct monitoring for health and safety hazards during initial site entry.****You must:**

- Make visual observations of the site to detect signs of actual or potential immediately dangerous to life or health (IDLH) or other dangerous conditions.

- Conduct representative air monitoring with direct reading test equipment, when the preliminary site evaluation does not eliminate the potential for ionizing radiation or IDLH conditions.

- Assess the following:

- Potential IDLH conditions.

- Exposure over radioactive material dose limits.

- Potential exposure over permissible exposure limits (PELs) or other published exposure levels.

- Other dangerous conditions, such as the presence of flammable or oxygen-deficient atmospheres.

**Reference:** See WAC 296-62-09004, Ionizing radiation, for additional information about radioactive material dose limits.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-13005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-13010 Evaluate employee exposure to hazardous substances during clean-up operations.****IMPORTANT:**

The clean-up operation begins when soil, surface water, or containers are moved or disturbed.

**You must:**

- Identify the type of personnel monitoring and environmental sampling you plan to use, including instrumentation.

- Include requirements for maintaining and calibrating the monitoring and sampling instruments used.

- Monitor whenever employees may be exposed to concentrations exceeding PELs or other published exposure levels.

- Evaluate employees who are likely to have the highest exposure:

- Monitor all employees who are likely to have the highest exposure to hazardous substances or health hazards above the PEL or published exposure limit.

- Use personal sampling frequently enough to characterize the exposures of these employees.

- When results indicate exposure is over the PEL or other published exposure level, identify all employees likely to be above the PEL or published exposure limit.

**Note:** You may use a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are representative of both:

- Employee exposure to hazardous substances;
- AND**
- Employees not sampled.

**You must:**

- Conduct monitoring when the possibility of one of the following exists:

- An atmosphere that is immediately dangerous to life or health (IDLH);

**OR**

- A flammable atmosphere;

**OR**

- Employee exposures exceeding PELs or other published exposure levels.

Examples of situations where these possibilities may exist:

- Work begins on a different portion of the site.

- Contaminants other than those previously monitored are being handled.

- A different type of site operation starts, such as moving from drum opening to exploratory well drilling.

- Handling leaking drums or containers.

- Working in areas with obvious liquid contamination such as a spill or lagoon.

- Time has passed and employee exposure levels may have significantly increased.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-13010, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-140 Site control.**

**Your responsibility:**

To establish a plan to control access to the site.

**You must:**

Establish a site control plan

WAC 296-843-14005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-140, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-14005 Establish site control.**

**You must:**

- Maintain site work zones and site control as required by Table 1, Site Work Zone Requirements.

- Control access to the exclusion and contamination reduction zones.

- Make sure people wear personal protective equipment (PPE) appropriate to their work zone.

[Title 296 WAC—p. 2980]

**Table 1  
Site Work Zone Requirements**

<b>For this type of work zone:</b>	<b>You must:</b>
Exclusion zone	<ul style="list-style-type: none"> <li>• Establish entry and exit checkpoints on the zone's boundary</li> <li>• Regulate the flow of people and equipment into and out of the zone</li> <li>• Make sure exits go through a contamination reduction corridor</li> </ul>
Contamination reduction zone with a contamination reduction corridor	<ul style="list-style-type: none"> <li>• Enter through a control point from the clean zone</li> <li>• Provide a transition or buffer between the exclusion zone and the clean zone</li> <li>• Perform all decontamination procedures</li> <li>• Establish separate decontamination routes for people and equipment, if practical</li> <li>• Remove all PPE worn in the contamination reduction or exclusion zones before entering the clean zone</li> </ul>
Clean zone or support zone	Have no employee exposure to hazardous substances or health hazards

**Note:** See Illustration 2 for an example of site work zones.

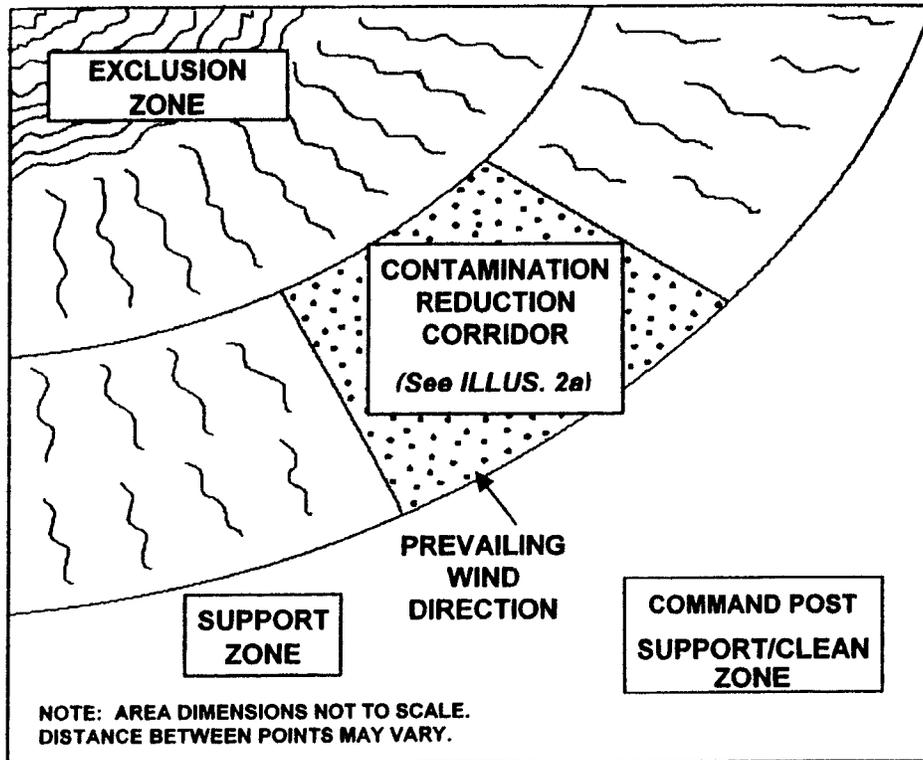


Illustration 2 -  
SITE WORK ZONES

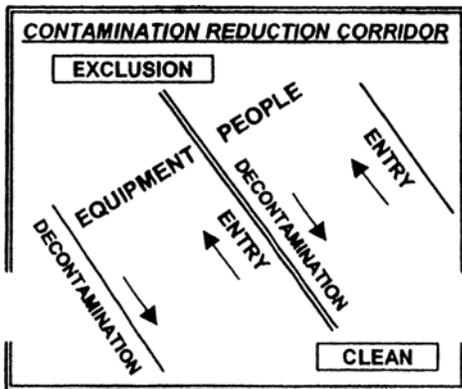


Illustration 2a -  
CONTAMINATION  
REDUCTION CORRIDOR

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-14005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-150 Worker and equipment decontamination.**

**Your responsibility:**

To make sure the necessary facilities and equipment for effective decontamination are available and used.

**You must:**

Establish and implement decontamination procedures before any worker or equipment enters a contaminated area  
WAC 296-843-15005.

Provide showers and changing rooms

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WAC 296-843-15010.

Provide washing facilities

WAC 296-843-15015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-150, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-15005 Establish and implement decontamination procedures before any worker or equipment enters a contaminated area.**

**You must:**

• Establish, implement, and communicate decontamination procedures to all workers, to include the following:  
– Standard operating procedures to minimize worker contact with:

- Hazardous substances.
- Contaminated equipment.
- Decontaminating all:
- Workers leaving a contaminated area.
- Equipment leaving a contaminated area.

– Decontaminating, cleaning, laundering, repairing, or replacing protective clothing or equipment (PPE) as needed to maintain effectiveness.

– Immediate removal of clothing, such as cotton coveralls, wet with hazardous substances and use of the nearest shower.

■ Decontaminate or dispose of clothing before removal from the work zone.

– Periodically monitoring procedures for effectiveness by the site safety and health supervisor.

– Correct your procedures when found ineffective.

– Establish decontamination areas to minimize contact of contaminated employees and equipment with uncontaminated employees or equipment.

– Make sure only authorized employees remove protective clothing or equipment from changing rooms.

– Inform commercial laundries or cleaning establishments about the potentially harmful effects from exposure to hazardous substances.

– Properly decontaminate or dispose of decontamination equipment and solvents.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-15005, filed 1/5/04, effective 5/1/04.]

### **WAC 296-843-15010 Provide showers and changing rooms.**

#### **You must:**

• Provide changing areas and showers outside a contaminated area, when needed for worker decontamination, that include at least the following:

– Separate changing areas:

■ One to provide a clean area where employees can remove, store, and put on street clothing with an exit leading off the work site.

■ Another where employees can put on, remove, store, and dispose of work clothing and PPE with an exit leading to the work site.

– A shower area separating the changing areas.

• Prevent clean areas from being contaminated by hazardous substances.

• Provide and use other effective means for worker cleansing, if temperature conditions prevent the effective use of water.

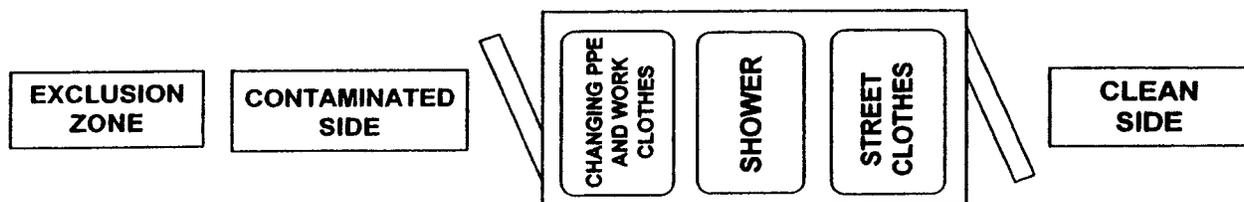
• Locate showers and change rooms where worker exposures are below permissible exposure limits (PELs) or other published exposure levels.

– If this cannot be accomplished, use a ventilation system to supply air that is below the PELs or published exposure levels.

• Make sure all workers shower at the end of their work shift or before they leave the site, when needed for worker decontamination.

Illustration 3 is a sample diagram of a change room layout.

**Change Room Layout**



**Illustration 3**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-15010, filed 1/5/04, effective 5/1/04.]

### **WAC 296-843-15015 Provide washing facilities.**

#### **You must:**

• Provide adequate washing facilities to employees working in hazardous waste operations that are:

– Close and convenient to the work area.

– Located in areas where employee exposure is below PELs or other published exposure levels.

– Equipped so an employee can remove hazardous substances from themselves without assistance.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-15015, filed 1/5/04, effective 5/1/04.]

### **WAC 296-843-160 Emergency response for hazardous waste sites.**

#### **Your responsibility:**

To establish an emergency response plan for emergencies at the hazardous waste site.

#### **You must:**

Establish an emergency response plan for anticipated emergencies before beginning hazardous waste operations

WAC 296-843-16005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-160, filed 1/5/04, effective 5/1/04.]

[Title 296 WAC—p. 2982]

### **WAC 296-843-16005 Establish an emergency response plan for anticipated emergencies before beginning hazardous waste operations.**

**Exemption:** Employers are exempt from preparing an emergency response plan if they do ALL of the following:

• Evacuate all employees from the danger area during an emergency.

• Prohibit employees from assisting in the emergency response.

• Prepare an emergency action plan that complies with WAC 296-24-567(1), Evacuation plan.

#### **IMPORTANT:**

Treatment, storage, and disposal (TSD) employers are not required to duplicate subjects fully addressed in the contingency plan required by permits when the contingency plan is part of their emergency response plan. Examples of permits would be those issued by the department of ecology.

#### **You must:**

(1) Establish and maintain the plan to reflect current site conditions, information, and personnel:

• Include policies or procedures for at least the following:

– Preemergency planning.

– Coordination with outside organizations.

– Current site topography, layout, and weather conditions.

– Personnel roles.

- Lines of authority.
- Communication.
- Reporting incidents to local, state, and federal government agencies.
- Emergency recognition and prevention.
- Safe distances and places of refuge.
- Site security and control.
- Evacuation routes.
- Decontamination not covered by the site-specific HASP.
- Emergency medical treatment and first aid.
- Emergency alert and response.
- Personal protective equipment and emergency equipment.
- Employee training.
- Critique of the response effort and appropriate followup.
- Use available information at the time of the emergency to:
  - Evaluate the incident and site response capabilities.
  - Proceed with appropriate steps to implement your emergency response plan.
  - Make sure the emergency response plan is:
    - Kept as a separate section of your site-specific health and safety plan (HASP);

**AND**

- Integrated and compatible with, local, state, and federal plans for disasters, fires, and emergency responses.
- (2) Establish an alarm system to alert employees to all of the following:
  - An on-site emergency incident:
    - To stop work activities, if necessary.
    - To lower background noise to assist communication.
    - To begin emergency procedures.
- (3) Rehearse the plan as part of site operations training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-16005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-170 Employee exposure controls.**

**Your responsibility:**

Implement feasible controls to protect employees from exposure to site hazards.

**You must:**

Control employee exposure to site health and safety hazards

WAC 296-843-17005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-170, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-17005 Control employee exposure to site health and safety hazards.**

**You must:**

- Use feasible controls, selected based on monitoring and other available information, to protect employee exposure above permissible exposure limits (PELs) or other published exposure levels.

- Examples of controls include:

- Installing pressurized cabs or control booths on equipment.
- Using remotely operated material handling equipment.

(2007 Ed.)

- Removing all nonessential employees when opening drums.
  - Wetting down dusty operations.
  - Positioning employees upwind of possible hazards.
    - Evaluate new technologies and other control measures before using them on a large scale.
    - Use any reasonable combination of controls and personal protective equipment (PPE) to reduce and maintain employee exposure at or below the PELs, published exposure levels, or dose levels when controls are not:
      - Feasible;
- OR**
- Effective.
  - Make sure PPE is NOT used as a replacement control.
  - PPE should be used only as a supplement to controls.

**Note:** For those hazardous substances without PELs or published exposure levels, use other published literature and material safety data sheets (MSDSs) to help decide what level of protection is appropriate. For more information about MSDSs, see WAC 296-800-180 in the *Safety and Health Core Rules* book.

**You must:**

- Use employee rotation to reduce exposure below ionizing radiation PELs or dose limits, when that is the **only** feasible means of protecting employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-17005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-180 Drum and container handling.**

**Your responsibility:**

To handle drums and containers in ways that minimize the hazard to employees.

**You must:**

Handle drums and containers safely

WAC 296-843-18005.

Handle drums and containers suspected of containing shock-sensitive (explosive) wastes safely

WAC 296-843-18010.

Maintain worker safety in drum and container opening areas

WAC 296-843-18015.

Ship and transport drums and containers safely

WAC 296-843-18020.

**IMPORTANT:**

- Containers or drums containing shock-sensitive (explosive) or potentially shock-sensitive wastes require special handling precautions.

- Handle, transport, label, and dispose of drums and containers according to this chapter and other United States Department of Transportation (DOT), WISHA, EPA, and Washington department of ecology regulations for:

- Drums.
- Containers.
- Hazardous substances.
- Contaminated soils.
- Liquids, and other residues.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-180, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-18005 Handle drums and containers safely.**

**Preparation for moving drums and containers:**

**You must:**

- Assess hazards to employees, such as radioactive waste, before handling drums and containers.
- Consider unlabeled drums and containers to contain hazardous substances and handle them accordingly, until the contents are positively identified, labeled, and assessed for hazards.
- Inspect and make sure drums and containers are sound before moving them.
  - If it is not practical to inspect drums without moving them, move drums and containers to an accessible location and inspect prior to further handling.
- Remove soil or other materials covering drums or containers with caution to prevent rupture.
- Use ground-penetrating systems or other types of detection systems or devices to estimate the location and depth of buried drums or containers.
- Use the sampling plan and procedures included in the site-specific HASP to sample the contents of containers and drums.

**Moving drums and containers:****You must:**

- Warn all employees exposed to drum movement operations about the potential hazards associated with the contents of the drums or containers prior to moving them.
- Minimize movement of drums or containers.
- Select, position, and operate tools and material handling equipment to prevent the ignition of flammable vapors.
- Handle tanks and vaults containing hazardous substances with the same precautions as for drums and containers, taking into account the size of tank or vault.

**Handling spills and leaks:****You must:**

- Contain and isolate the entire volume of a hazardous substance in a drum or container when a spill occurs.
- Have available and use both of the following in areas where spills, leaks, or ruptures may occur:
  - United States Department of Transportation (DOT) specified salvage drums or containers.
  - Suitable quantities of proper absorbent materials.
- Empty drums and containers, that cannot be moved without rupturing, leaking, or spilling, into a sound container.
  - Use a pump or other device classified for the material being transferred.
- Have fire-extinguishing equipment on-hand to control fires in their initial stage.

**Reference:** For further information, see the safety and health core rules, WAC 296-800-300, Portable fire extinguishers.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-18005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-18010 Handle drums and containers suspected of containing shock-sensitive (explosive) wastes safely.**

**You must:**

- Allow only essential employees in the transfer area.
- Communicate as follows:
  - Signal the beginning and end of shock-sensitive (explosive) waste handling activities with an alarm system that is capable of being perceived above background light and noise.

[Title 296 WAC—p. 2984]

- Maintain continuous communications throughout the handling operation:

- Between the employee-in-charge of the immediate handling area AND the site safety and health supervisor AND the command post.

- Using portable radios, hand signals, or telephones, as appropriate.

- Prevent the use of communication equipment or methods that could cause shock-sensitive (explosive) materials to explode.

- Provide material handling equipment with explosive containment devices or shields to protect equipment operators from exploding containers.

- Do not move bulging or swollen drums or containers until the cause for excess pressure is determined and you can move the drum or container safely.

- Consider packaged laboratory wastes or laboratory waste packs shock-sensitive or explosive until the contents have been characterized.

- Make sure laboratory waste packs are opened only:

- When necessary.

- By a person knowledgeable in the inspection, classification, and segregation of the containers within the pack.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-18010, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-18015 Maintain worker safety in drum and container opening areas.**

**You must:**

- Keep employees who are not involved in opening drums or containers a safe distance from the opening area.

- Use appropriate shielding between the employee and the drums or containers, when excess interior pressure cannot be relieved from a remote location.

- Provide an explosion-resistant barrier that does not interfere with the work to protect employees working near or adjacent to drum or container opening operations from accidental explosions.

- Position controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment behind the explosion-resistant barrier. Prohibit employees from standing on or working from drums or containers.

**Reference:** The shipment of shock-sensitive (explosive) waste may be prohibited under United States Department of Transportation (DOT) regulations. You and your shipper should refer to title 49 CFR.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-18015, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-18020 Ship and transport drums and containers safely.**

**You must:**

- (1) Identify and classify drum and container contents prior to packaging for shipment.

- (2) Provide staging areas:

- Each staging area must have adequate entry and exit routes.

- The number of drum or container staging areas must be kept to the minimum needed to identify and classify materials safely and prepare them for transport.

(2007 Ed.)

(3) Permit bulking of hazardous wastes only after a thorough characterization of the wastes has been completed.

- Note:** Handle, transport, label, and dispose of drums and containers according to this chapter and other United States Department of Transportation (DOT), WISHA, EPA, and Washington department of ecology regulations for:
- Drums.
  - Containers.
  - Hazardous substances.
  - Contaminated soils.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-18020, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-190 Personal protective equipment (PPE).**

**Your responsibility:**

To use PPE to protect employees when feasible controls do not remove the hazardous exposure.

**You must:**

Provide and use appropriate PPE  
WAC 296-843-19005.

**Reference:** For additional information about developing a PPE plan, see the PPE user guide found at <http://www.lni.wa.gov/wisha/publications/PPEGuide/PPEload.htm>.

**Note:** The manufacturer's information on PPE may be used to meet your PPE plan requirements. For example, the manufacturer's procedures for putting on and taking off PPE may be attached to the site-specific health and safety plan (HASP).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-190, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-19005 Provide and use appropriate PPE.**

**Reference:** See WAC 296-843-110, Evaluations and inspections, found in this chapter, for more information about how to identify hazards and complete your preliminary site evaluation.

**You must:**

(1) Make sure the PPE you provide and use for initial entry protects employees from known or suspected safety and health hazards identified during the preliminary site evaluation as follows:

If	Then
The need for atmosphere supplying respirators and chemical protective clothing has NOT been eliminated	Provide atmosphere supplying respirators and protective clothing
Employees use respiratory protection other than a positive-pressure SCBA for initial entry	Include an escape self-contained breathing apparatus (SCBA) with enough air to reach a safe location and always at least five minutes of air

• Use Table 2, Selecting PPE in Various Exposure Situations, to determine the level of PPE to provide during initial entry:

**You must:**

- (2) Make sure the PPE you select provides employee protection based on:
- Actual and potential hazards identified during the site characterization and analysis (see WAC 296-843-110, Evaluations and inspections).
  - Hazards likely to be encountered.

- Required tasks and their duration.
- Site requirements and limitations.
- Use Table 2 to identify the type of PPE that is required for various exposure situations.

**Table 2  
Selecting PPE in Various Exposure Situations**

If	Then
Changing site conditions indicate a change in employee exposure	Review and adjust the level of protection as appropriate  <b>Note:</b> You may decrease the level of protection when information indicates this will not increase employee exposure to safety or health hazards
There is a substantial possibility that skin absorption or contact with a hazardous substance may: <ul style="list-style-type: none"> <li>• Impair an employee's ability to escape</li> <li>• Cause immediate serious illness or injury</li> <li>• Is an IDLH or immediate death hazard</li> </ul>	Use totally encapsulating chemical protective (TECP) suits and make sure they will protect employees from the hazards  <ul style="list-style-type: none"> <li>• Use, decontaminate, inspect, and remove TECP suits from service according to the manufacturer's recommendations</li> <li>• Perform any TECP integrity tests recommended by the manufacturer and make sure all TECP suits are capable of:                             <ul style="list-style-type: none"> <li>– Maintaining positive air pressure</li> <li>– Preventing inward test gas leakage of more than 0.5%</li> </ul> </li> </ul> <b>Note:</b> Follow the manufacturer's recommended procedures for testing a TECP suit's ability to maintain positive air pressure and prevent inward gas leakage. Other established test protocols for these suits, for example, NFPA 1991 and ASTM F1052-97, may also be used
There is a substantial possibility that employee exposure to hazardous substances will either: <ul style="list-style-type: none"> <li>• Immediately cause death, serious illness, or serious injury</li> </ul> <b>OR</b>	Use a positive-pressure SCBA or an airline respirator with an escape SCBA  <ul style="list-style-type: none"> <li>• Protect air supply from contamination and the entire respirator system from physical damage</li> </ul>



If	Then	Notes
		<ul style="list-style-type: none"> <li>One forty-hour training class as described below and an additional forty hours of training that emphasizes hazards requiring the use of atmosphere-supplying respirators and of chemical protective clothing</li> </ul> <p>Refresher training, previous courses, supervised field experience, and previous work experience may count towards the additional forty hours, if it improves the worker's competency to use respirators and chemical protective clothing ensembles and procedures</p>
Work and exposures may exceed the PEL or require protective clothing but do not require atmosphere supplying respirators	Provide forty hours of training and three days of supervised on-site field experience	Workers with twenty-four hours of training may become forty hour trained with sixteen hours of off-site training and two additional days of supervised on-site field experience
Workers are occasionally on-site to perform specific limited tasks and unlikely to be exposed above PELs or other published exposure limits	Provide twenty-four hours of training and one day of supervised on-site field experience	
Workers are regularly on-site but work in areas fully characterized and monitored, with exposure under the PELs or other published exposure limits: <ul style="list-style-type: none"> <li>No need for respirators</li> <li>No health hazards</li> <li>No possibility of an emergency</li> </ul>	Provide twenty-four hours of training and one day of supervised on-site field experience	
Workers are at TSD facilities under normal operations (this does not include corrective actions cleanup at these facilities)	Provide twenty-four hours of training and one day of supervised on-site field experience	
Employees perform emergency response activities	Train workers to a level of competence in site emergencies, consistent with their assigned duties, to protect themselves and other employees	
Workers qualify for limited postemergency response clean-up training	Provide at least eight hours of training	See WAC 296-843-20020, Training for postemergency response, for detailed training information

If	Then	Notes
Workers have been previously trained (includes equivalent training)	Provide site-specific training, briefings and information required by this chapter and supervised field experience on the site of one day for twenty-four-hour and three days for forty- or eighty-hour trained workers	Document equivalent training and work experience as required by WAC 296-843-20025

**Note:** When calculating "training hours," WISHA assumes a "normal" workday of eight hours with sufficient time for lunch and other breaks.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-20010, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-20015 Provide additional training to your managers and supervisors.**

**You must:**

- Make sure the following receive appropriate training:
  - On-site managers.
  - Supervisors responsible for hazardous waste operations.
  - Supervisors who directly supervise employees in hazardous waste operations.

- Make sure such supervisors and on-site managers receive the same training as that required by the workers they supervise (see WAC 296-843-20010).

- Make sure such supervisors and managers receive a minimum of eight additional hours of specialized training including the following information:

- Written site-specific health and safety plan (HASP):
  - Training plan.
  - Personal protective equipment (PPE) plan.
  - Spill containment plan.
  - Emergency management procedures to use when a release of hazardous substances occurs.
  - Federal, state, and local agencies to be contacted if there is a release of hazardous substances.
  - Sampling and monitoring plan (including procedures and techniques for monitoring health hazards).
- Managing hazardous wastes and their disposal.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-20015, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-20020 Training for postemergency response.**

**You must:**

- Provide workers who participate only in limited postemergency response clean-up operations with a minimum of eight hours of training, when these conditions are met:
  - Cleanup is at a site that is a hazardous waste operation only because of an emergency response.
  - Clean-up work is directly supervised by someone who has completed at least forty hours of training in hazardous waste operations as required in this chapter.

- Written documentation is maintained at the work site supporting less than twenty-four hours of training.

- The work:
  - Is performed in an area that has been monitored and fully characterized by a qualified person as an area where

employee exposure cannot exceed PELs or other published exposure levels.

- Does not require using respiratory protection.

- Does not require entry into permit-required confined spaces.

- Involves minimal health risks from skin exposure and absorption that are effectively controlled by PPE.

- Workers have received training in your emergency response plan and hazard communication program.

**Reference:** For additional information, see WAC 296-843-160, Emergency response, and WAC 296-800-170, Employer chemical hazard communication.

**You must:**

- Make sure workers complete any other safety and health training needed to perform assigned clean-up tasks in a safe and healthful manner.

- Training may include topics such as the following:

- Safety hazards and controls.

- The content and availability of the site-specific health and safety plan.

- Decontamination procedures.

- Operating procedures related to assigned clean-up tasks.

- PPE use and limitations.

- Hands-on exercises for PPE and decontamination.

- Information about heat stress and hypothermia.

- Make sure workers have been trained within the last twelve months.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-20020, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-20025 Make sure your employees receive written documentation of training.**

**You must:**

- Certify and document annually that each manager, supervisor, and worker has either:

- Attended and successfully completed the training required by this section;

**OR**

- Demonstrated their competency.

- Record and maintain the method used to demonstrate competency.

- Make sure your employees and supervisors who complete required training and field experience receive written training documentation authenticated by the responsible trainer.

- Provide a copy of the certification or documentation to your employee upon request.

**Note:** Equivalent training may include academic or work-related training that covers subjects required by this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-20025, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-20030 Provide refresher training to employees.**

**You must:**

- Make sure all certified employees, supervisors, and managers receive eight hours of refresher training at least every twelve months that covers:

- The topics specified in WAC 296-843-200.

- Assessments or evaluations of work-related incidents.

- Any other relevant topics.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-20030, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-20035 Use qualified trainers.**

**You must:**

Use trainers that:

- Have demonstrated competent instructional skills.

- Demonstrate knowledge of the subject matter and have

either:

- Satisfactorily completed a training program in the subject;

**OR**

- Have the academic credentials and instructional experience needed for teaching the subject.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-20035, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-210 Medical surveillance.**

**Your responsibility:**

To provide medical surveillance for employees that work in hazardous waste operations.

**You must:**

Provide medical surveillance for your employees

WAC 296-843-21005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-210, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-21005 Provide medical surveillance for your employees.**

**You must:**

- Establish a medical surveillance plan for all employees who meet any of the following:

- Are or may be exposed to hazardous substances or health hazards for at least thirty days a year, at or above the permissible exposure limits (PELs) or other published exposure levels.

- Wear a respirator for at least thirty days a year.

- Are injured, become ill, or develop signs or symptoms of possible overexposure to hazardous substances or health hazards.

- Are hazardous materials team (HAZMAT) members.

**Reference:** Employees who use respirators less than thirty days a year are required to have a respirator medical evaluation as outlined by chapter 296-842 WAC, Respirators. Completion of a medical examination required by this section will meet the requirement for a respirator medical evaluation.

**You must:**

- Make sure medical examinations, consultations, and procedures are:

- Scheduled according to Table 4, Medical Examination Schedule.

- Performed or supervised by a licensed physician.

- Available:

- At a reasonable time and place.

- Without loss of pay.

- Without cost to employees.

**Note:** Examples of costs include: Mileage, gas, bus fare, and time spent outside normal work hours.

**Table 4**  
**Medical Examination Schedule**

<b>If a worker</b>	<b>Then provide an examination</b>
Is assigned to work that is covered by this chapter	Before work assignment begins
Continues to work in hazardous waste operations	At least once every twelve months, unless the attending physician decides a different interval, up to twenty-four months or less than twelve months, is appropriate
Needs to be examined more frequently based on the examining physician's medical judgment	At an interval less than twelve months
Is reassigned to an area where their work is not covered <b>OR</b> Employment is terminated	As soon as possible, unless he or she was examined within the past six months
Has an incident that results in injury or illness <b>OR</b> Develops signs or symptoms of possible overexposure to hazardous substances and health hazards <b>OR</b> Has been exposed above the permissible exposure limits or published exposure levels	As soon as possible
Requires follow-up examinations or consultations because of medical necessity for an exposure incident or injury	When determined by the examining physician

**You must:**

- Make sure the medical examination includes the following information for each affected employee:

- A medical and work history, with special emphasis on symptoms related to handling hazardous substances and health hazards.

- Information about fitness for duty including the ability to wear any personal protective equipment (PPE) under conditions that may be expected at the workplace.

- Any additional information that is determined by the examining physician.

**Note:** The physician should consult the NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities <http://www.cdc.gov/niosh/85-115.html>.

**You must:**

- Provide complete information to the examining physician, including:

- A copy of WAC 296-843-210.

- Medical evaluation information required by chapter 296-842 WAC, Respirators.

- A description of the employee's duties that relate to hazardous substance exposure.

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- The actual or anticipated hazardous substance exposure levels for the employee.

- A description of the PPE the employee uses or could use.

- Information available from previous medical examinations.

- Instruction to the physician that the physician's written opinion NOT include specific findings or diagnoses that are not related to occupational exposures.

**Note:** You are NOT required to send duplicate information to the physician for each employee.

**You must:**

- Obtain the physician's written medical opinion that includes the following information:

- Whether medical conditions were found that would increase the employee's risk for impairment during emergency response work or respirator use.

- Limitations of the employee's assigned work, if any.

- Examination and test results, if the employee requests this information.

- A statement that the employee has been confidentially informed of medical examination results (including medical conditions requiring followup required by WAC 296-843-210).

- Provide the employee with a copy of the physician evaluation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-21005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-220 Recordkeeping and information access.**

**Your responsibility:**

To keep records and make them accessible to employees.

**You must:**

Make your records accessible

WAC 296-843-22005.

Keep medical surveillance records for your employees

WAC 296-843-22010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-220, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-22005 Make your records accessible.**

**You must:**

- Allow your written health and safety plan (HASP) and all other written plans required by this chapter to be inspected and copied by:

- Employees or their designated representative.

- Site contractors or their designated representatives.

- Subcontractors or their designated representatives.

- Personnel of any federal, state, or local agency with regulatory authority over the site.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-22005, filed 1/5/04, effective 5/1/04.]

**WAC 296-843-22010 Keep medical surveillance records for your employees.**

**You must:**

- Keep medical surveillance records for each affected employee that include:

- The employee's name and Social Security number.

[Title 296 WAC—p. 2989]

- Physicians' written opinions including recommended limitations and results of examinations and tests.
- Any employee medical complaints regarding hazardous substance exposures.
- A copy of all information given to the examining physician (except a copy of this chapter).
  - Keep each employee's records for at least the duration of his or her employment plus thirty years.

**Reference:** For additional requirements on medical and exposure records, see chapter 296-62 WAC, Part B, Access to records.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 04-02-053, § 296-843-22010, filed 1/5/04, effective 5/1/04.]

## **WAC 296-843-300 Definitions.**

### **Buddy system**

A system of organizing employees into work groups so that each employee is assigned to observe another employee in the same work group. The purpose of this system is to provide rapid assistance to employees in the event of an emergency.

### **Clean-up operation**

An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared up, or in any other manner processed or handled with the goal of making the site safer for people or the environment.

### **Contamination reduction zone**

The buffer zone between the exclusion and the clean zone.

### **Decontamination**

The removal of hazardous substances from employees and equipment, to the extent necessary, to avoid foreseeable adverse health effects.

### **Emergency response or responding to emergencies**

An organized response to an anticipated release of a hazardous substance that is, or could become, an uncontrolled release.

### **Exclusion zone**

A controlled area at a site, where contamination occurs, that is a risk to human health or the environment.

### **Exposure or exposed**

Employee contact with a toxic substance, harmful physical agent, or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

### **Facility**

Any building structure, installation, equipment, pipe, or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft;

### **OR**

Any site or area where a hazardous substance has been deposited, stored, disposed of, placed, or otherwise located (not including any boat, ship or barge).

### **Hazardous substance**

Any of the following substances that could adversely affect an exposed employee's health or safety:

- Substances defined under section 101(14) of the Comprehensive Environmental Response, Compensation and Lia-

bility Act of 1980 (CERCLA) or "Superfund" Act (found at: <http://www.epa.gov>).

- Biological or other disease-causing agents released that could reasonably be expected to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions, including malfunctions in reproduction, or physical deformations in a person or their offspring when the person:
  - Is directly exposed to the agent in the environment.
  - Directly ingests, inhales, or assimilates the agent from the environment.
  - Indirectly ingests the agent through a food chain.

- Substances listed by the United States Department of Transportation as hazardous materials under Title 49 (Transportation) in the Code of Federal Regulations (CFR), Part 172, section 101 and appendices (found at: <http://www.nara.gov>, search for "List of CFR subjects").

- Hazardous wastes as defined in this chapter.

**Hazardous waste**

Any substance designated by the department of ecology as a dangerous or extremely hazardous waste by chapter 173-303 WAC, Dangerous waste regulations.

**Hazardous waste site**

A hazardous waste site is any facility or location within the scope of this chapter.

### **Hazardous materials team (HAZMAT team)**

A group of employees who are expected to perform responses to releases, or possible releases, of hazardous substances for the purpose of control and stabilization. As a result of their duties, HAZMAT team members may have close contact with hazardous substances.

### **Health hazard**

A chemical, mixture, biological agent, or physical agent that may cause health effects in short- or long-term exposed employees based on statistically significant evidence from at least one study conducted using established scientific principles. Health hazards include:

- Carcinogens.
- Toxic or highly toxic agents.
- Reproductive toxins.
- Irritants.
- Corrosives.
- Sensitizers.
- Hepatotoxins (liver toxins).
- Nephrotoxins (kidney toxins).
- Neurotoxins (nervous system toxins).
- Substances that act on the hematopoietic system (blood or blood-forming system).
- Substances that can damage the lungs, skin, eyes, or mucous membranes.
- Hot or cold conditions.

### **IDLH or immediately dangerous to life or health**

Any atmospheric condition that would:

- Cause an immediate threat to life;

### **OR**

- Cause permanent or delayed adverse health effects;
- OR**
- Interfere with an employee's ability to escape.

**Incidental release**

A release that can be safely controlled at the time of the release and does not have the potential to become an uncontrolled release.

An example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

**Material safety data sheet (MSDS)**

Written, printed, or electronic information (on paper, microfiche, or on-screen) that informs manufacturers, distributors, employers or employees about a hazardous chemical, its hazards and protective measures as required by chapter 296-839 WAC, Content and distribution of material safety data sheets (MSDSs) and label information.

**Oxygen deficiency**

An atmosphere where the percentage of oxygen by volume is less than 19.5%.

**Permissible exposure limit (PEL)**

Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are specified in applicable WISHA rules.

**Published exposure level**

Exposure limits published in "*National Institute for Occupational Safety and Health (NIOSH) Recommendations for Occupational Safety and Health*" (DHHS publication #92-100, 1992).

If an exposure limit is not published by NIOSH, then "published exposure level" means the exposure limits published by the American Conference of Governmental Industrial Hygienists (ACGIH) in "*TLVs and BEIs-Threshold Limit Values for Chemical Substances and Physical Agents*" (1999 edition).

**Postemergency response**

The stage of the emergency response where the immediate threat from the release has been stabilized or eliminated, and cleanup of the site has started. For more information, see the definition for "emergency response."

**Site safety and health supervisor (or official)**

The individual present at a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to establish the site-specific health and safety plan and verify compliance with applicable safety and health requirements.

**Site work zones**

Zones established at a hazardous waste site before clean-up work begins to control work on the site and access to the site. The work zones are: Exclusion zone, contamination reduction zone, and clean zone.

**Uncontrolled hazardous waste site**

An area where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both. Examples include: Former municipal, county, or state landfills, locations where illegal or poorly managed waste disposal has taken place, or property of gen-

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erators or former generators of hazardous substance waste (surface impoundments, landfills, dumps, and tank or drum farms).

**Uncontrolled release**

A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or couldn't create a safety or health hazard (i.e., fire, explosion, or chemical exposure) aren't considered to be uncontrolled releases.

Examples of conditions that could create a significant safety and health risk:

- Large-quantity releases.
- Small releases that could be highly toxic.
- Potentially contaminated individuals arriving at hospitals.
- Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees aren't adequately trained or equipped to control the release.

Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver hasn't been trained or provided appropriate equipment to address this type of spill. In this situation, it isn't safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 04-02-053, § 296-843-300, filed 1/5/04, effective 5/1/04.]

## Chapter 296-848 WAC ARSENIC

**WAC**

296-848-100	Scope.
296-848-200	Basic rules.
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296-848-20025	Washing facilities.
296-848-20060	Exposure evaluations.
296-848-20070	Notification.
296-848-20090	Exposure records.
296-848-300	Training, exposure monitoring, and medical monitoring.
296-848-30005	Training.
296-848-30010	Periodic exposure evaluations.
296-848-30030	Medical evaluations.
296-848-30080	Medical records.
296-848-400	Exposure control areas.
296-848-40005	Exposure control plan.
296-848-40020	Exposure controls.
296-848-40025	Exposure control areas.
296-848-40030	Clean-up facilities and lunchrooms.
296-848-40040	Personal protective equipment (PPE).
296-848-40045	Respirators.
296-848-500	Definitions.

**WAC 296-848-100 Scope.** This chapter applies to all occupational exposure to inorganic arsenic.

**Definitions:**

Inorganic arsenic means elemental arsenic (As), copper aceto-arsenite, and inorganic compounds containing arsenic (measured as As), except arsine. Inorganic compounds do not contain the element carbon.

Exposure is the contact an employee has with inorganic arsenic, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can

occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

**Helpful tool:**

**Arsenic contamination in soil; information and guidance for employers.**

Use this tool if you have employees who work with soil. It will help you find out if this rule is applicable to your employee's exposure to soil.

- Exemptions:**
- This chapter does not apply to any of the following:
    - Exposures during agricultural operations.
    - Pesticide applications, including the treatment of wood with preservatives.
    - Use of wood treated with inorganic arsenic.
    - Arsine, a gas identified by Chemical Abstract Service (CAS) Registry No. 7784-42-1.
    - Inorganic arsenic present in a form and handled in such a way that airborne exposures could not occur. For example, inorganic arsenic present in glass is fused in the material. Due to the fused form, airborne exposure can not occur when the glass is scored and subsequently broken.

All requirements in this chapter will not apply to every workplace with an occupational exposure. The following steps will show you which requirements apply to your workplace.

**Step 1:** Follow requirements in the basic rules sections, WAC 296-848-20010 through 296-848-20090.

- This includes completing an exposure evaluation, as specified in Exposure evaluations, WAC 296-848-20060, to:
  - Obtain employee eight-hour exposure monitoring results of airborne inorganic arsenic;

**AND**

– Determine if employee exposure monitoring results are above, at, or below these values:

- Eight-hour time-weighted average (TWA<sub>8</sub>). . . . . 10 micrograms per cubic meter (µg/m<sup>3</sup>).
- Eight-hour action level (AL). . . . . 5 µg/m<sup>3</sup>.

**Step 2:** Use employee exposure monitoring results from Step 1 and follow Table 1 to find out which additional sections of this chapter apply to your workplace.

**Table 1  
Sections That Apply To Your Workplace**

<b>If:</b>	<b>Then continue to follow the Basic Rules, and these additional requirements:</b>
• Employee exposure monitoring results are above the TWA <sub>8</sub>	• Training, exposure monitoring, and medical monitoring, WAC 296-848-30005 through 296-848-30080; <b>AND</b> • Exposure control areas, WAC 296-848-40005 through 296-848-40045.
• Employee exposure monitoring results are: – At or below the TWA <sub>8</sub> ; <b>AND</b> – At or above AL	• Training, exposure monitoring, and medical monitoring, WAC 296-848-30005 through 296-848-30080.
• Employee exposure monitoring results are below the AL; <b>AND</b>	• No additional requirements apply if exposures remain stable.

**Table 1  
Sections That Apply To Your Workplace**

<b>If:</b>	<b>Then continue to follow the Basic Rules, and these additional requirements:</b>
• Eye or skin irritation from exposure to inorganic arsenic cannot occur	
• Employees could experience eye or skin irritation from exposure to inorganic arsenic	• Training in WAC 296-848-30005. • Washing, showering, and changing in WAC 296-848-40030. • Personal protective equipment (PPE) in WAC 296-848-40040.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 06-02-060, § 296-848-100, filed 1/3/06, effective 4/1/06; 05-01-173, § 296-848-100, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-200 Basic rules.**

**Summary:**

**Your responsibility:**

To measure and minimize employee exposure to inorganic arsenic.

**IMPORTANT:**

The sections listed in basic rules apply to all employers covered by the scope of this chapter, WAC 296-848-100. To find additional sections that may apply to you, go to the Scope, WAC 296-848-100, and follow Table 1.

- Contents
- Preventive practices  
WAC 296-848-20010.
- Washing facilities  
WAC 296-848-20025.
- Exposure evaluations  
WAC 296-848-20060.
- Notification  
WAC 296-848-20070.
- Exposure records  
WAC 296-848-20090.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-200, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-20010 Preventive practices.**

**You must:**

(1) Effectively communicate the hazards of inorganic arsenic by doing both of the following:

- Keep container labels free of statements that contradict or detract from the labels' hazard warning.

**Note:** You may use labels required by other laws, rules, or ordinances in addition to, or in combination with, labels required by this section.

**You must:**

- Make sure shipping containers, storage containers, and products containing inorganic arsenic are labeled, tagged, or marked with this warning:

Danger  
 Contains Inorganic Arsenic  
 Cancer Hazard  
 Harmful if Inhaled or Swallowed  
 Use Only with Adequate Ventilation  
 or  
 Respiratory Protection

**Note:** • You should keep containers tightly covered when not in use to help prevent unnecessary exposure and accidental spills.

• Contaminated items should be handled and disposed of to prevent further exposure in the workplace. For example, vacuuming or wet wiping contaminated equipment helps prevent the release of dust into the air.

**Reference:** • Additional requirements are found in other chapters:  
 – For spills, leaks, or other releases, go to Emergency response, chapter 296-824 WAC.  
 – For labeling go to:  
 • The Safety and health core rules, chapter 296-800 WAC, and find the section, Label containers holding hazardous chemicals, WAC 296-800-17025;  
**AND**  
 • Material safety data sheet and label preparation, chapter 296-839 WAC.

**You must:**

(2) Establish safe and effective housekeeping and maintenance practices by doing all the following:

• Develop and keep a written housekeeping and maintenance plan that lists appropriate frequencies for:

– Housekeeping operations;

**AND**

– Cleaning and maintaining dust collection equipment.

• Keep surfaces free of accumulations of inorganic arsenic, to the degree feasible.

• When cleaning floors and other accessible surfaces:

– Use vacuuming or other cleaning methods that minimize the release of inorganic arsenic into the air.

– Do not use compressed air.

– Select vacuums that have high efficiency particulate air (HEPA) filters.

– Use and empty vacuums in a way that minimizes the release of inorganic arsenic back into the workplace.

**Note:** • Shoveling or brushing may be used only when vacuuming or other cleaning methods have not been effective.

• Using non-HEPA vacuums will increase inorganic arsenic contamination in air and on area surfaces.

**You must:**

• Maintain ventilation systems, including dust collection equipment, to make sure they are effective. Do all of the following:

– Perform periodic inspections for effectiveness.

– Periodically clean the equipment.

– Keep a note of the most recent inspection for effectiveness, and cleaning or maintenance.

(3) Prevent eye or skin contact with:

• Arsenic trichloride;

**AND**

• Liquid or particulate forms of inorganic arsenic when contact could cause eye or skin irritation.

**Note:** Arsenic trichloride is corrosive and can be quickly absorbed through skin.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-20010, filed 12/21/04, effective 5/1/05.]

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**WAC 296-848-20025 Washing facilities.**

**You must:**

• Provide washing facilities for employees exposed to inorganic arsenic.

**References:** For additional washing facility requirements, go to another chapter, the Safety and health core rules, chapter 296-800 WAC, and find the section titled, Provide convenient and clean washing facilities, WAC 296-800-23025.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-20025, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-20060 Exposure evaluations.**

**IMPORTANT:**

• This section applies when workplace operations create potential airborne exposure to inorganic arsenic.

• When you conduct an exposure evaluation in a workplace where an employee uses a respirator, the protection provided by the respirator is not considered.

• Following this section will fulfill the requirements to identify and evaluate respiratory hazards found in another chapter, Respiratory hazards, chapter 296-841 WAC.

**You must:**

(1) Conduct an employee exposure evaluation to accurately determine airborne concentrations of inorganic arsenic by completing Steps 1 through 5 of the Exposure Evaluation Process, each time any of the following apply:

• No evaluation has been conducted.

• Changes have occurred in any of the following areas that may result in new or increased exposures:

– Production.

– Processes.

– Exposure controls such as ventilation systems or work practices.

– Personnel.

• You have any reason to suspect new or increased exposure may occur.

(2) Provide affected employees and their designated representatives an opportunity to observe exposure monitoring during Step 4 of the Exposure Evaluation Process.

• Make sure observers do not interfere with exposure measurements.

• Make sure observers are entitled to:

– An explanation of your exposure measurement and monitoring procedures;

– Observe all tasks of exposure measurement performed at the workplace;

**AND**

– Receive a copy of the exposure measurement results when you obtain them; or are allowed to record the exposure measurement results, if made during observations.

• Make sure observers who enter areas with inorganic arsenic exposure:

– Are provided with and use the same protective clothing, respirators, and other personal protective equipment (PPE) that employees working in the area are required to use;

**AND**

– Follow safety and health requirements that apply.

**Exposure Evaluation Process**

**IMPORTANT:**

Following the Exposure Evaluation Process is not necessary when you have documentation conclusively demonstrat-

ing inorganic arsenic exposures for a particular operation and material, cannot exceed the action level (AL) during any conditions reasonably anticipated. Documentation can be based on quantitative information such as soil test results OR qualitative information such as observations of how inorganic arsenic-containing materials are handled.

– Retain this documentation for as long as you rely on it.

**Step 1:** Identify all employees who have potential airborne exposure to inorganic arsenic in your workplace.

**Step 2:** Select employees from those identified in Step 1 who will have their eight-hour exposures monitored.

• Make sure the exposures of the employees selected represent eight-hour exposures for all employees identified in Step 1, including each job classification, work area, and shift.

**Note:** • A written description of the procedure used for obtaining representative employee exposure monitoring results needs to be kept as part of your exposure records required by this chapter in Exposure records, WAC 296-848-20090. This description can be created while completing Steps 2 through 4 of this exposure evaluation process.

**Step 3:** Determine how you'll obtain employee exposure monitoring results.

• Select and use a method that meets the following criteria for accuracy:

–  $\pm 25\%$ , with a confidence level of 95%, when concentrations are potentially at or above an eight-hour time-weighted average of 10 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ );

OR

–  $\pm 35\%$ , with a confidence level of 95%, when concentrations are potentially between the eight-hour time-weighted averages of 5  $\mu\text{g}/\text{m}^3$  and 10  $\mu\text{g}/\text{m}^3$ .

**Note:** • Here are examples of methods that meet this accuracy requirement:  
– OSHA Method ID105 found by going to <http://www.osha.gov/dts/sltc/methods/toc.html>.  
– NIOSH method 7901 found by going to <http://www.cdc.gov/niosh/homepage.html> and linking to the NIOSH Manual of Analytical Methods.

**Step 4:** Obtain employee exposure monitoring results by collecting air samples representing employees identified in Step 1.

• Sample at least one shift representative of the eight-hour exposure, for each employee selected in Step 2.

• Make sure samples are collected from each selected employee's breathing zone.

**Note:** • You may use any sampling method that meets the accuracies specified in Step 3. Examples of these methods include:  
– Real-time monitors that provide immediate exposure monitoring results.  
– Equipment that collects samples that are sent to a laboratory for analysis.  
• The following are examples of methods for collecting samples representative of eight-hour exposures.  
– Collect one or more continuous samples, for example, a single eight-hour sample or four two-hour samples.  
– Take a minimum of 4 to 7 brief samples, such as fifteen-minute samples, during the work shift and at times selected randomly.  
• For work shifts longer than eight hours, monitor the continuous eight-hour portion of the shift expected to have the highest average exposure concentration.

**Step 5:** Have the samples you collected analyzed to obtain monitoring results representing eight-hour exposures.

• Go to the Scope of this chapter, WAC 296-848-100, and compare employee exposure monitoring results to the

values found in Step 1 and follow Step 2 to determine if additional sections of this chapter apply.

**Note:**

- You may contact your local WISHA consultant for help:
  - Interpreting data or other information.
  - Determining eight-hour employee exposure monitoring results.
- To contact a WISHA consultant:
  - Go to the Safety and health core rules, chapter 296-800 WAC;

**AND**

- Find the Resources section, and under "Other Resources," find *Service Locations for Labor and Industries*.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-20060, filed 12/21/04, effective 5/1/05.]

### WAC 296-848-20070 Notification.

#### You must:

• Provide written notification of exposure monitoring results, including notification about whether exposures exceed the permissible exposure limit (PEL), to employees represented by your exposure evaluation, within five business days after the monitoring results become known to you.

– In addition, when employee exposure monitoring results are above the permissible exposure limit (PEL), provide written notification of all the following within fifteen business days after these exposure monitoring results become known to you.

■ Corrective actions being taken and a schedule for completion;

**AND**

■ Any reason why exposures cannot be lowered to below the PEL.

**Note:**

- You can notify affected employees either individually or post the notifications in areas readily accessible to affected employees.
- When notifying employees about corrective actions, your notification may refer them to a separate document that is available and provides the required information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-20070, filed 12/21/04, effective 5/1/05.]

### WAC 296-848-20090 Exposure records.

#### You must:

• Establish and keep complete and accurate records for all exposure monitoring conducted under this chapter. Make sure the record includes, at least:

– The name, Social Security number or other unique identifier, and job classification of the employee sampled and all other employees represented by the sampled employee.

– A description of the methods used to obtain exposure monitoring results and evidence of the method's accuracy.

– A description of the procedure used to obtain representative employee exposure monitoring results.

– The date, number, duration, location, and the result of each sample taken.

– Any environmental conditions that could affect exposure concentration measurements.

**Note:** It's useful to record any personal protective equipment worn by the employee in addition to the type of respirator worn.

#### You must:

• Keep exposure monitoring records for at least thirty years.

**Reference:** • To see additional requirements for employee exposure records including access and transfer requirements, go to

another chapter, Employee medical and exposure records, chapter 296-802 WAC.  
 • Exposure monitoring records need to be kept longer than thirty years for employees participating in medical monitoring. Go to Medical records, WAC 296-848-30080, found within this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-20090, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-300 Training, exposure monitoring, and medical monitoring.**

**Summary:**

**Your responsibility:**

To detect any significant changes in employee health and exposure monitoring results.

**IMPORTANT:**

• These sections apply when skin or eye irritation could occur or when employee exposure monitoring results are either:

– At or above the action level (AL) of 5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for inorganic arsenic;

**OR**

– Above the permissible exposure limit (PEL) of 10  $\mu\text{g}/\text{m}^3$  for inorganic arsenic.

**Contents**

**Training**

WAC 296-848-30005.

Periodic exposure evaluations

WAC 296-848-30010.

Medical evaluations

WAC 296-848-30030.

Medical records

WAC 296-848-30080.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-300, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-30005 Training.**

**You must:**

• Train employees:

– Who are exposed above the action level (AL) of 5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air;

**OR**

– Who could experience eye or skin irritation from exposure.

• Provide training:

– At the time of initial assignment;

**AND**

– At least every twelve months after initial training.

• Make sure training and information includes all of the following:

– A review of this chapter.

– The information found in another chapter:

■ Go to the General occupational health standards, chapter 296-62 WAC;

**AND**

■ Find Appendix A-Inorganic Arsenic Substance Information Sheet, WAC 296-62-07354(1).

– The purpose for medical evaluations and a description of how you are fulfilling the medical evaluation requirements of this chapter found in Medical evaluations, WAC 296-848-30030.

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• Make a copy of each of the following readily available to all employees required to be trained under this section:

– This chapter;

**AND**

– These appendices found in another chapter, the General occupational health standards, chapter 296-62 WAC:

■ Appendix A-Inorganic Arsenic Substance Information Sheet, WAC 296-62-07354(1).

■ Appendix B-Substance Technical Guidelines, WAC 296-62-07354(2).

■ Appendix C-Medical Surveillance Guidelines, WAC 296-62-07354(3).

**Reference:** • To see additional training and information requirements in other chapters, go to the:

– Respirators rule, chapter 296-842 WAC.

– Safety and health core rules, chapter 296-800 WAC, and find the section titled, Inform and train your employees about hazardous chemicals in your workplace, WAC 296-800-17030.

• When following these requirements, include specific information about potential exposures to inorganic arsenic, such as the types of operations, locations, quantities, exposure sources, exposure controls, inorganic arsenic use, and storage.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-30005, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-30010 Periodic exposure evaluations.**

**Exemption:** • Periodic exposure evaluations aren't required if exposure monitoring results conducted to fulfill requirements in Exposure evaluation, WAC 296-848-20060, are below the action level (AL).

**You must:**

• Obtain employee exposure monitoring results as specified in Table 2 by repeating Steps 2, 4, and 5 of the Exposure Evaluation Process found within this chapter, in Exposure evaluations, WAC 296-848-20060.

**Note:** If you document that one work shift consistently has higher exposure monitoring results than another for a particular operation, then you limit sample collection to the work shift with higher exposures and can use results to represent all employees performing the operation on other shifts.

**Table 2  
Periodic Exposure Evaluation Frequencies**

<b>If 8-hour employee exposure monitoring results:</b>	<b>Then:</b>
Are between the: – Action level (AL) of 5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ); <b>AND</b> – Permissible exposure limit (PEL) of 10 $\mu\text{g}/\text{m}^3$	Conduct additional exposure evaluations at least every six months for the employees represented by the monitoring results.
Are above the PEL	Conduct additional exposure evaluations at least every three months for the employees represented by the monitoring results.

[Title 296 WAC—p. 2995]

**Table 2**  
**Periodic Exposure Evaluation Frequencies**

<b>If 8-hour employee exposure monitoring results:</b>	<b>Then:</b>
For employees previously above the PEL, have decreased: – To a concentration between the PEL and AL; <b>AND</b> – The decrease is demonstrated by two consecutive exposure evaluations made at least seven days apart	You may decrease your evaluation frequency to every six months for the employees represented by the monitoring results.
Have decreased to below the AL; <b>AND</b> The decrease is demonstrated by two consecutive exposure evaluations made at least seven days apart	You may stop periodic employee exposure evaluations for employees represented by the monitoring results.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-30010, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-30030 Medical evaluations.**

**IMPORTANT:**

• Medical evaluations conducted under this section will satisfy the medical evaluation requirement found in another chapter, Respirators, chapter 296-842 WAC.

**You must:**

• Make medical evaluations available to current employees who have been, are, or will be exposed to inorganic arsenic concentrations above the AL:

– At least thirty days in any twelve-month period;

**OR**

– A total of ten years or more of combined employment with you or previous employers with at least thirty days of exposure per year.

• Make medical evaluations available at no cost to employees.

– Pay all costs, including travel costs and wages associated with any time spent outside of the employee's normal work hours.

• Make medical evaluations available at reasonable times and places.

• Make medical evaluations available by completing Steps 1 through 6 of the Medical Evaluation Process for each employee covered.

**Note:**

• Employees who wear respirators need to be medically evaluated to make sure the respirator will not harm them, before they are assigned work in areas requiring respirators. Employees who decline to receive medical examination and testing to monitor for health effects caused by inorganic arsenic are not excluded from receiving a separate medical evaluation for a respirator use.

• If employers discourage participation in medical monitoring for health effects caused by inorganic arsenic, or in any way interfere with an employee's decision to continue with this program, this interference may represent unlawful discrimination under RCW 49.17.160, Discrimination against employee filing, instituting proceeding, or testifying prohibited—Procedure—Remedy.

**Helpful tool:**

**Declination form for nonemergency related medical evaluations.**

You may use this optional form to document employee decisions to decline participation in the medical evaluation process for exposure to inorganic arsenic. To see this form, go to the Resources section within this chapter.

**Medical Evaluation Process**

**Step 1:** Identify employees who qualify, as stated above, for medical evaluations.

**Step 2a:** Make medical evaluations available for employees identified in Step 1 at the following times:

- Initially, when employees are assigned to work in an area where exposure monitoring results are, or will likely be, above the action level for at least thirty days in a twelve-month period.

- Periodically as specified in Table 3.

- When employment with exposure ends, if the employee has not had an evaluation within the six-month period before exposure ends. Include in these evaluations the same content as specified in Table 4 for initial evaluations, excluding a chest X ray.

**Table 3**  
**Frequencies for Periodic Medical Evaluations**

<b>For:</b>	<b>Provide periodic medical evaluations every:</b>
Employees less than forty-five years old with less than ten years of exposure above the AL	Twelve months;
Employees forty-five or older; <b>AND</b> Employees with more than ten years of exposure above the AL	Six months;  <b>AND</b> Twelve months to obtain a fourteen by seventeen-inch posterior-anterior chest X ray for monitoring purposes, unless the LHCP has determined a different frequency for periodic X rays.

**Step 2b:** Provide appropriate medical examination and emergency treatment when an employee identified in Step 1 develops signs or symptoms commonly associated with inorganic arsenic exposure.

**Step 3:** Select a licensed health care professional (LHCP) who will conduct or supervise examinations and procedures.

**Step 4:** Make sure the LHCP receives all of the following before the medical evaluation is performed:

- A copy of:  
– This chapter;

**AND**

- The following information found in the General occupational health standards, chapter 296-62 WAC:

- Appendix A-Inorganic Arsenic Substance Information Sheet, WAC 296-62-07354(1).

- Appendix B-Substance Technical Guidelines, WAC 296-62-07354(2).

■ Appendix C-Medical Surveillance Guidelines, WAC 296-62-07354(3).

- A description of the duties of the employee being evaluated and how these duties relate to inorganic arsenic exposure.

- The anticipated or representative exposure monitoring results for the employee being evaluated.

- A description of the personal protective equipment (PPE) each employee being evaluated uses or will use.

- Information from previous employment-related examinations when this information is not available to the examining LHCP.

- Instructions that the written opinions the LHCP provides you be limited to the following information:

- Results from examinations and tests.

- The LHCP's opinion about whether or not medical conditions were found that would increase the employee's risk for impairment from exposure to inorganic arsenic.

- Any recommended limitations for:

- ■ Inorganic arsenic exposure;

AND

- ■ Use of respirators or other PPE.

- A statement that the employee has been informed of medical results and medical conditions caused by inorganic arsenic exposure requiring further examination or treatment.

**Step 5:** Make the medical evaluation available to the employee. Make sure it includes the content listed in Table 4, Content of Medical Evaluations.

**Step 6:** Obtain the LHCP's written opinion for the employee's medical evaluation and give a copy to the employee.

- Make sure the written opinion is limited to the information specified for written opinions in Step 4.

**Note:** If the written opinion contains specific findings or diagnoses unrelated to occupational exposure, send it back and obtain a revised version without the additional information.

**Table 4**  
**Content of Medical Evaluations**

<b>When conducting:</b>	<b>Include:</b>
Periodic evaluations for employees less than forty-five years old with less than ten years of exposure above the action level (AL)	<ul style="list-style-type: none"> <li>• The same content as specified for initial evaluations repeated every twelve months.</li> </ul>
Periodic evaluations for employees: <ul style="list-style-type: none"> <li>• Forty-five or older;</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• With more than ten years of exposure above the AL</li> </ul>	<ul style="list-style-type: none"> <li>• The following content repeated every six months:                             <ul style="list-style-type: none"> <li>– A work history and medical history including:                                     <ul style="list-style-type: none"> <li>■ Smoking history.</li> <li>■ The presence and degree of respiratory symptoms such as breathlessness, cough, sputum production, and wheezing.</li> </ul> </li> <li>– A physical examination that includes a nasal and skin examination.</li> <li>– Additional examinations the LHCP believes appropriate based on the employee's exposure to inorganic arsenic or respirator use.</li> </ul> </li> <li>• A physical examination, repeated every twelve months, that obtains a fourteen by seventeen-inch posterior-anterior chest X ray and the International Labor Office UICC/Cincinnati (ILO U/C) rating.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-30030, filed 12/21/04, effective 5/1/05.]

**Table 4**  
**Content of Medical Evaluations**

<b>When conducting:</b>	<b>Include:</b>
An initial evaluation	<ul style="list-style-type: none"> <li>• A work history and medical history including:                             <ul style="list-style-type: none"> <li>– Smoking history.</li> <li>– The presence and degree of respiratory symptoms such as breathlessness, cough, sputum production, and wheezing.</li> </ul> </li> <li>• A physical examination that includes:                             <ul style="list-style-type: none"> <li>– A fourteen by seventeen-inch posterior-anterior chest X ray and the International Labor Office UICC/Cincinnati (ILO U/C) rating.</li> <li>– A nasal and skin examination.</li> </ul> </li> <li>• Additional examinations the licensed healthcare professional (LHCP) believes appropriate based on the employee's exposure to inorganic arsenic or respirator use.</li> </ul>

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**WAC 296-848-30080 Medical records.**

**IMPORTANT:**

- This section applies when a medical evaluation is performed, or any time a medical record is created for an employee exposed to inorganic arsenic.

**You must:**

- Establish and maintain complete and accurate medical records for each employee receiving a medical evaluation and make sure the records include all the following:

- The employee's name and Social Security number, or other unique identifier.

- A description of the employee's duties.

- A copy of the licensed health care professional's (LHCP's) written opinions.

- The anticipated or representative employee exposure monitoring results provided to the LHCP for the employee.

- Maintain medical evaluation records for the duration of employment plus thirty years.

**Note:** • Your medical provider may keep these records for you. Other medical records, such as the employee's medical history or X ray, need to be kept as a confidential record by the medical provider and accessed only with the employee's consent.

**Reference:** • To see additional requirements for employee medical record, including access and transfer requirements, go to

Employee medical and exposure records, chapter 296-802 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-30080, filed 12/21/04, effective 5/1/05.]

### WAC 296-848-400 Exposure control areas.

#### Summary:

#### Your responsibility:

To protect employees from exposure to inorganic arsenic by using feasible exposure controls and appropriate respirators.

#### IMPORTANT:

These sections apply when employee exposure monitoring results are above the permissible exposure limit (PEL) of 10 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air.

#### Contents

Exposure control plan

WAC 296-848-40005.

Exposure controls

WAC 296-848-40020.

Exposure control areas

WAC 296-848-40025.

Clean-up facilities and lunchrooms

WAC 296-848-40030.

Personal protective equipment

WAC 296-848-40040.

Respirators

WAC 296-848-40045.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-400, filed 12/21/04, effective 5/1/05.]

### WAC 296-848-40005 Exposure control plan.

#### IMPORTANT:

Use of employee rotation to control exposures is not advisable since inorganic arsenic is a known carcinogen.

#### You must:

• Establish and implement a complete written exposure control plan that includes at least the following, for exposure control areas:

– A description of each operation releasing inorganic arsenic, for example:

- Crew size.
- Current exposure controls.
- Materials processed.
- Machinery used.
- Operating procedures.
- Maintenance practices.

– Exposure evaluation data.

– A report of the technology considered for exposure controls.

– Engineering plans and studies used as a basis for selecting exposure controls.

– A detailed schedule for implementing:

■ Feasible exposure controls, if immediate implementation is not possible.

■ Changes to enhance current exposure controls, when necessary.

– An analysis of the effectiveness of the exposure controls considered, when controls will not reduce exposures to or below the permissible exposure limit (PEL).

– Other relevant information.

[Title 296 WAC—p. 2998]

• Review and update your exposure control plan at least every six months to keep it current.

• Implement exposure controls on the quickest schedule feasible if controls will not reduce exposure to or below the PEL.

• Provide a copy of your exposure control plan to affected employees and their designated representatives, when they ask to review or copy it.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-40005, filed 12/21/04, effective 5/1/05.]

### WAC 296-848-40020 Exposure controls.

#### IMPORTANT:

• Use of employee rotation to control exposures is not advisable since inorganic arsenic is a known carcinogen.

• Respirators and other personal protective equipment (PPE) do not substitute for feasible exposure controls.

#### You must:

• Use feasible exposure controls to reduce exposures to or below the permissible exposure limit (PEL), or as low as achievable.

**Reference:** To see examples of exposure controls go to Respiratory hazards, chapter 296-841 WAC, and find Table 1 in the section, Control employee exposure, WAC 296-848-20010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-40020, filed 12/21/04, effective 5/1/05.]

### WAC 296-848-40025 Exposure control areas.

#### You must:

• Establish temporary or permanent exposure control areas where airborne concentrations of inorganic arsenic are above the permissible exposure limit (PEL) by doing all the following:

– Distinguish the boundaries of exposure control areas from the rest of the workplace in any way that minimizes employee access.

– Allow only authorized personnel to enter exposure control areas.

– Post signs at access points to exposure control areas that include this warning:

<p>DANGER Inorganic Arsenic Cancer Hazard Authorized Personnel Only No Smoking or Eating Respirator Required</p>
--

– Make sure signs are kept clean and well lit so they are easy to read.

– Keep signs and areas near them free of statements that contradict or detract from their message.

**Note:** This requirement does not prevent you from posting signs required by other laws, rules, or ordinances.

#### You must:

– Make sure employees entering exposure control areas have an appropriate respirator.

– Prevent all of the following activities from occurring in exposure control areas unless they are conducted in required lunchrooms, change rooms, or showers:

- Eating food or drinking beverages.
- Smoking.

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- Chewing tobacco or gum.
- Applying cosmetics.

**Note:**

- You may use permanent or temporary enclosures, caution tape, ropes, painted lines on surfaces, or other materials to visibly distinguish exposure control areas or separate them from the rest of the workplace.
- When distinguishing exposure control areas, you should consider factors such as:
  - The level and duration of airborne exposure.
  - Whether the area is permanent or temporary.
  - The number of employees in adjacent areas.

**Reference:** To see other requirements for respirators within this chapter, go to Respirators, WAC 296-848-40045.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-40025, filed 12/21/04, effective 5/1/05.]

### **WAC 296-848-40030 Clean-up facilities and lunchrooms.**

**You must:**

- Provide the following facilities for employees who could experience eye or skin irritation from exposure to inorganic arsenic or who work in exposure control areas:
    - Clean change rooms with separate storage for street clothes and personal protective equipment (PPE).
    - Shower facilities.
  - Make sure employees who could experience eye or skin irritation from exposure to inorganic arsenic or who work in exposure control areas:
    - Shower at the end of the work shift;
- AND**
- Wash their hands and face before eating.
  - Provide lunchrooms for employees working in exposure control areas that are:
    - Located so they are readily accessible to the employees.
    - Temperature controlled.
    - Under positive pressure compared to surrounding areas.
    - Provided with a filtered air supply.

**Note:** Lunchrooms may be located within exposure control areas, but are considered separate from the exposure control area.

- Do the following when exposures in exposure control areas exceed an eight-hour time-weighted average of 100 micrograms of arsenic per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ):
  - Provide facilities for employees working in exposure control areas where they can remove excess contamination from protective clothing and shoes.
  - Make sure employees vacuum protective clothing and clean or change shoes before entering showers, change rooms, or lunchrooms.

**Reference:** To see additional requirements for hygiene facilities:

- Go to the Safety and health core rules, chapter 296-800 WAC.
- Find Drinking water, bathrooms, washing facilities, and waste disposal, WAC 296-800-230.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-40030, filed 12/21/04, effective 5/1/05.]

### **WAC 296-848-40040 Personal protective equipment (PPE).**

**You must:**

- Provide, make sure employees use, and maintain PPE as follows:

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- Provide clean and dry protective clothing to employees who could experience eye or skin irritation from exposure to inorganic arsenic or who work in exposure control areas.
- Provide impervious protective clothing to employees exposed to arsenic trichloride.

**Note:**

- Arsenic trichloride is corrosive and can be rapidly absorbed through skin.
- Examples of protective clothing appropriate for inorganic arsenic exposures include:
  - Coveralls or similar full-body work clothing.
  - Gloves, and shoes or coverlets.
  - Face shields or vented goggles when necessary to prevent eye irritation.

**You must:**

- Make sure employees do not remove inorganic arsenic from PPE by blowing or shaking.
- Make sure protective clothing is removed:
  - In change rooms;

**AND**

- At the end of the work shift.
  - Make sure contaminated protective clothing that will be cleaned, laundered, or disposed of, is placed in a closed container located in the change room.
  - Make sure the container prevents the release of inorganic arsenic.

– Launder protective clothing:

- At least weekly if employees work in areas where exposure monitoring results of inorganic arsenic are below an eight-hour time-weighted average concentration of 100 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ );

**OR**

- Daily if employees work in areas where either exposure monitoring results of inorganic arsenic are above an eight-hour time-weighted average concentration of 100  $\mu\text{g}/\text{m}^3$  or when more frequent washing is needed to prevent skin irritation.

– Maintain the effectiveness of PPE by repairing or replacing it, as needed:

- Dispose of protective clothing if it will not be repaired.
  - Inform individuals who clean or launder protective clothing about the possible health effects associated with inorganic arsenic, including carcinogenic effects, by doing the following:

– Provide the information in writing;

**AND**

– Label containers of contaminated PPE with the following warning:

**CAUTION:**

Clothing contaminated with inorganic arsenic  
Do not remove dust by blowing or shaking  
Dispose of inorganic arsenic contaminated wash water as applicable local, state, or federal regulations require

**Reference:** To see additional Personal protective equipment requirements go to the Safety and health core rules, chapter 296-800 WAC, and find the section titled, PPE, WAC 296-800-160.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-173, § 296-848-40040, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-40045 Respirators.****IMPORTANT:**

• The requirements in this section are in addition to the requirements found in other chapters:

- Respiratory hazards, chapter 296-841 WAC.
- Respirators, chapter 296-842 WAC.

**You must:**

• Provide respirators and require that employees use them in circumstances where exposure is above the permissible exposure limit (PEL), including any of the following circumstances:

- Employees are in an exposure control area.
- Feasible exposure controls are being put in place.
- Where you determine that exposure controls are not feasible.

– Feasible exposure controls do not reduce exposures to, or below, the PEL.

- Emergencies.

• Make sure air-purifying respirators selected have high-efficiency particulate air (HEPA) filters or N-, R-, or P-100 filters.

• Provide an employee a powered air-purifying respirator (PAPR) when this type of respirator will provide proper protection and:

- A licensed health care professional (LHCP) allows this type of respirator in their written opinion.

**OR**

- The employee chooses to use this type of respirator.

• Prohibit the use of half-facepiece respirators for protection against arsenic trichloride.

**Note:** Arsenic trichloride is corrosive and can be rapidly absorbed through skin.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-173, § 296-848-40045, filed 12/21/04, effective 5/1/05.]

**WAC 296-848-500 Definitions.****Action level**

An airborne concentration of inorganic arsenic of 5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air calculated as an eight-hour time-weighted average.

**Authorized personnel**

Individuals specifically permitted by the employer to enter the exposure control area to perform duties, or to observe employee exposure evaluations as a designated representative.

**Breathing zone**

The space around and in front of an employee's nose and mouth, forming a hemisphere with a 6- to 9-inch radius.

**CAS (Chemical Abstract Service) number**

CAS numbers are internationally recognized and used on material safety data sheets (MSDSs) and other documents to identify substances. For more information see <http://www.cas.org/about>.

**Day**

Any part of a calendar day.

**Designated representative**

Any one of the following:

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written employee authorization.

[Title 296 WAC—p. 3000]

- The legal representative of a deceased or legally incapacitated employee.

**Emergency**

Any event that could or does result in the unexpected significant release of inorganic arsenic. Examples of emergencies include equipment failure, container rupture, or control equipment failure.

**Exposure**

The contact an employee has with inorganic arsenic, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

**Inorganic arsenic**

Elemental arsenic (As), copper aceto-arsenite, and inorganic compounds containing arsenic (measured as As), except arsine. Inorganic compounds do not contain the element carbon.

**Licensed health care professional (LHCP)**

An individual whose legally permitted scope of practice allows him or her to provide some or all of the healthcare services required for medical evaluations.

**Permissible exposure limits (PELs)**

PELs are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are also specified in WISHA rules found in other chapters. The PEL for inorganic arsenic is an eight-hour time-weighted average ( $\text{TWA}_8$ ) of 10 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).

**Time-weighted average ( $\text{TWA}_8$ )**

An exposure limit averaged over an eight-hour period that must not be exceeded during an employee's workday.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-173, § 296-848-500, filed 12/21/04, effective 5/1/05.]

**Chapter 296-849 WAC****BENZENE****WAC**

296-849-100	Scope.
296-849-110	Basic rules.
296-849-11010	Preventive practices.
296-849-11020	Exposure control areas.
296-849-11030	Exposure evaluations.
296-849-11040	Personal protective equipment (PPE).
296-849-11050	Training.
296-849-11065	Exposure monitoring observation.
296-849-11070	Notification.
296-849-11090	Exposure records.
296-849-120	Exposure and medical monitoring.
296-849-12010	Periodic exposure evaluations.
296-849-12030	Medical evaluations.
296-849-12050	Medical removal.
296-849-12080	Medical records.
296-849-130	Rules for exposure control areas.
296-849-13005	Exposure control plan.
296-849-13020	Exposure controls.
296-849-13045	Respirators.
296-849-190	Definitions.

**WAC 296-849-100 Scope.** This chapter applies to all occupational exposure to benzene.

**Definition:**

*Exposure* is the contact an employee has with benzene, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur

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through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

- Exemptions:** This chapter does not apply to any of the following:
- Liquids, vapors, mixtures in containers or pipelines, and gas in natural gas processing plants when benzene content is 0.1% or less.
  - Gasoline and other fuels containing benzene once they leave the final bulk wholesale facility and are being:
    - Transported;
    - Sold;
    - Distributed;
    - Stored;
    - Dispensed either:
      - Outdoors;
      - OR
      - Indoors four hours or less a day.
    - Used as a fuel.
  - Oil and gas drilling, production, and servicing operations.
  - Solid materials that contain only trace amounts of benzene.
  - Coke ovens.

All requirements in this chapter will not apply to every workplace with an occupational exposure. The following will show you which requirements apply to your workplace.

**Step 1:** If any of your work tasks are listed in Table 1, follow Table 1.

- Go to Step 2a if you have additional work tasks or other exposures that are not covered in Table 1.

**Table 1**  
**Requirements that Apply to Specific Tasks**

If employees do any of the following:	Then the only requirements in this chapter that apply to those tasks are:
Load and unload benzene at bulk storage facilities that use vapor control systems for all loading and unloading operations.	<ul style="list-style-type: none"> <li>• The labeling requirement found in Preventive practices, WAC 296-849-11010.</li> </ul>
Perform tasks around sealed transport pipelines carrying gasoline, crude oil, or other liquids containing more than 0.1% benzene.	<ul style="list-style-type: none"> <li>• This requirement found in Training, WAC 296-849-11050:                             <ul style="list-style-type: none"> <li>– Make sure training and information includes specific information on benzene for each hazard communication training topic. For the list of hazard communication training topics, go to the Safety and health core rules, chapter 296-800 WAC, and find Inform and train your employees about hazardous chemicals in your workplace, WAC 296-800-17030.</li> </ul> </li> </ul>
Work with, or around, sealed containers of liquids containing more than 0.1% benzene.	<ul style="list-style-type: none"> <li>• Emergency requirements found in Medical evaluations, WAC 296-849-12030.</li> <li>• Requirements found in Medical records, WAC 296-849-12080.</li> </ul>

If employees do any of the following:	Then the only requirements in this chapter that apply to those tasks are:
	<ul style="list-style-type: none"> <li>• Respirator requirements found in Respirators, WAC 296-849-13045.</li> </ul>

**Step 2a:** Follow requirements in the basic rules sections, WAC 296-849-11010 through 296-849-11090, for tasks **not** listed in Table 1.

- This includes completing an exposure evaluation, as specified in Exposure evaluations, WAC 296-849-11030, to:
  - Obtain employee fifteen-minute and eight-hour exposure monitoring results of airborne benzene;

**AND**

– Determine if employee exposure monitoring results are above, at, or below these values:

■ Eight-hour time-weighted average (TWA<sub>8</sub>). . . . . 1 parts per million (ppm).

■ Fifteen-minute short-term exposure limit (STEL). . . . . 5 ppm.

■ Eight-hour action level (AL). . . . . 0.5 ppm.

**Step 2b:** Use employee exposure monitoring results from Step 2a and follow Table 2 to find out which additional sections of this chapter apply to your workplace.

**Table 2**  
**Section Application**

If employee exposure monitoring results are:	Then continue to follow the basic rules, and these additional requirements:
<ul style="list-style-type: none"> <li>• <b>Above</b> the TWA<sub>8</sub> or STEL</li> </ul>	<ul style="list-style-type: none"> <li>• Exposure and medical monitoring, WAC 296-849-12005 through 296-849-12080;</li> <li><b>AND</b></li> <li>• Exposure control areas, WAC 296-849-13005 through 296-849-13045.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>At or below</b> the TWA<sub>8</sub> or STEL;</li> <li>• <b>At or above</b> AL</li> </ul>	<ul style="list-style-type: none"> <li>• Exposure and medical monitoring, WAC 296-849-12005 through 296-849-12080.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Below</b> the AL and STEL</li> </ul>	<ul style="list-style-type: none"> <li>• No additional requirements apply.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-13-152, § 296-849-100, filed 6/21/05, effective 8/1/05; 05-01-172, § 296-849-100, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-110 Basic rules.**

**Summary:**

**Your responsibility:**

To measure and minimize employee exposure to benzene.

**IMPORTANT:**

To determine which requirements to follow for your work tasks, go to Table 1 in the scope of this chapter, WAC 296-849-100.

**Contents:**

Preventive practices  
WAC 296-849-11010.  
Exposure control areas  
WAC 296-849-11020.  
Exposure evaluations  
WAC 296-849-11030.  
Personal protective equipment (PPE)  
WAC 296-849-11040.  
Training  
WAC 296-849-11050.  
Exposure monitoring observation  
WAC 296-849-11065.  
Notification  
WAC 296-849-11070.  
Exposure records  
WAC 296-849-11090.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-110, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-11010 Preventive practices.****You must:**

• Make sure containers of benzene in the workplace are labeled, tagged, or marked with this warning:

DANGER  
CONTAINS BENZENE  
CANCER HAZARD

**Note:** You should keep containers tightly covered when not in use to prevent unnecessary exposure and accidental spills.

**References:** Additional requirements are found in other chapters as follows:

• For spills, leaks, or other releases of benzene, go to Emergency response, chapter 296-824 WAC.

• For labeling go to:

– The Safety and health core rules, chapter 296-800 WAC, and find the section Label containers holding hazardous chemicals, WAC 296-800-17025;

**AND**

– Material safety data sheet and label preparation, chapter 296-839 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-11010, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-11020 Exposure control areas.****You must:**

• Establish temporary or permanent exposure control areas where airborne concentrations of benzene are above, or can be reasonably expected to be above, the permissible exposure limits (PELs) for benzene by doing all the following:

– Post signs at access points to exposure control areas that include this warning:

DANGER  
Benzene  
Cancer Hazard  
Flammable - No Smoking  
Authorized Personnel Only  
Respirator Required

– Distinguish the boundaries of exposure control areas from the rest of the workplace in any way that minimizes employee access.

[Title 296 WAC—p. 3002]

– Allow only authorized personnel to enter exposure control areas.

**Note:**

- You may use permanent or temporary enclosures, caution tape, ropes, painted lines on surfaces, or other materials to visibly distinguish exposure control areas or separate them from the rest of the workplace.

- When distinguishing exposure control areas you should consider factors such as:

- The level and duration of airborne exposure.

- Whether the area is permanent or temporary.

- The number of employees in adjacent areas.

**Reference:** If exposure control areas are established, go to Respirators, WAC 296-849-13045.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-11020, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-11030 Exposure evaluations.****IMPORTANT:**

• When you conduct an exposure evaluation in a workplace where an employee uses a respirator, the protection provided by the respirator is not considered.

• Following this section will fulfill the requirements to identify and evaluate respiratory hazards found in another chapter, Respiratory hazards, chapter 296-841 WAC.

**You must:**

• Conduct an employee exposure evaluation to accurately determine airborne concentrations of benzene by completing Steps 1 through 7 of the exposure evaluation process, each time any of the following apply:

- No evaluation has been conducted.

- You have up to thirty days to complete an evaluation once benzene is introduced into your workplace.

- Changes have occurred in any of the following areas that may result in new or increased exposures:

- Production.

- Processes.

- Exposure controls such as ventilation systems or work practices.

- Personnel.

- You have any reason to suspect new or increased exposure may occur.

- Spills, leaks, or other releases have been cleaned up.

**Note:** As part of your exposure evaluation after cleanup, you will make sure exposure monitoring results have returned to prerelease levels.

**Exposure evaluation process.****IMPORTANT:**

• If you are evaluating employee exposures during cleaning and repair of barges and tankers that contained benzene:

- Collect samples that effectively measure benzene concentrations that employees may be exposed to;

**AND**

- Skip to Step 7.

• Following the exposure evaluation process is not necessary when you have documentation conclusively demonstrating benzene exposures for a particular operation and material cannot exceed the action level (AL) during any conditions reasonably anticipated.

- Documentation can be based on data or qualitative information, such as information about:

- The material.

- How the material is handled.

- The work conditions.

- Retain this documentation for as long as you rely on it.

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**Step 1:** Identify all employees who have potential airborne exposure to benzene in your workplace.

**Step 2:** Identify operations where fifteen-minute exposures could exceed benzene's short-term exposure limit (STEL) of 5 parts per million (ppm).

- Include operations where it is reasonable to expect high, fifteen-minute exposures, such as operations where:

- Tanks are opened, filled, unloaded, or gauged.
- Containers or process equipment are opened.
- Benzene is used as a solvent for cleaning.

**Note:** You may use monitoring devices such as colorimetric indicator tubes or real-time monitors to screen for activities where employee exposure monitoring results could be high.

**Step 3:** Select employees from those working in the operations you identified in Step 2 who will have their fifteen-minute exposures measured.

**Step 4:** Select employees from those identified in Step 1 who will have their eight-hour exposures monitored.

- Make sure the exposures of the employees selected represent eight-hour exposures for **all** employees identified at Step 1, including each job classification, work area, and shift.

**Note:** A written description of the procedure used for obtaining representative employee exposure monitoring results needs to be kept as part of your exposure records required by this chapter in Exposure records, WAC 296-849-11090. This description can be created while completing Steps 3 through 6 of this exposure evaluation process.

**Step 5:** Determine how you will obtain employee monitoring results.

- Select and use a method that is accurate to  $\pm 25\%$ , with a confidence level of 95%.

**Note:**

- Here are examples of methods that meet this accuracy requirement:
  - OSHA Method 12 for air samples, found by going to <http://www.osha.gov/dts/sltc/methods/toc.html>.
  - NIOSH Method 1500, found by going to <http://www.cdc.gov/niosh/homepage.html> and link to the *NIOSH Manual of Analytical Methods*.

**Step 6:** Obtain employee exposure monitoring results by collecting air samples representing employees identified at Step 1.

- Collect fifteen-minute samples from employees selected at Step 3.

- Sample at least one shift representative of the eight-hour exposure for each employee selected at Step 4.

- Make sure samples are collected from each selected employee's breathing zone.

- Collecting area samples is permitted after emergency releases.

**Note:**

- You may use any sampling method that meets the accuracy specified in Step 5. Examples of these methods include:
  - Real-time monitors that provide immediate exposure monitoring results.
  - Equipment that collects samples that are sent to a laboratory for analysis.
- The following are examples of methods of monitoring representative of eight-hour exposures:
  - Collect one or more continuous samples, for example, a single eight-hour sample or four two-hour samples.
  - Take a minimum of five brief samples, such as fifteen-minute samples, during the work shift and at times selected randomly.
- For work shifts longer than eight hours, monitor the continuous eight-hour portion of the shift expected to have the highest average exposure concentration.

**Step 7:** Have the samples you collected analyzed to obtain monitoring results representing eight-hour and fifteen-minute exposures.

- Go to the scope of this chapter, WAC 296-849-100, and compare employee exposure monitoring results to the **values** found in Step 2a and follow Step 2b to determine if additional sections of this chapter apply.

**Note:**

- You may contact your local WISHA consultant for help:
  - Interpreting data or other information.
  - Obtaining eight-hour or fifteen-minute employee exposure monitoring results.
- To contact a WISHA consultant:
  - Go to another chapter, the Safety and health core rules, chapter 296-800 WAC, and find the resources section, and under "other resources," find service location for labor and industries.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-13-152, § 296-849-11030, filed 6/21/05, effective 8/1/05; 05-01-172, § 296-849-11030, filed 12/21/04, effective 3/1/05.]

### WAC 296-849-11040 Personal protective equipment (PPE).

**You must:**

- Make sure employees use appropriate PPE as protection from skin or eye contact with liquid benzene.

**Note:** Harmful amounts of benzene can enter the body through skin and eye contact.

**Reference:** To see additional personal protective equipment requirements, go to the Safety and health core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-01-172, § 296-849-11040, filed 12/21/04, effective 3/1/05.]

### WAC 296-849-11050 Training.

**You must:**

- Provide training and information to employees:
  - At the time of initial assignment to a work area where benzene is present;

**AND**

- At least every twelve months after initial training for employees exposed to airborne concentrations at or above the action level (AL) of 0.5 parts per million (ppm).

- Make sure training and information includes all of the following:

- Specific information on benzene for each hazard communication training topic. For the list of hazard communication training topics, go to the Safety and health core rules, chapter 296-800 WAC, and find Inform and train your employees about hazardous chemicals in your workplace, WAC 296-800-17030;

**AND**

- An explanation of the contents of each of the following and guidance about where to find a copy:

- This chapter.

- The following found in another chapter, the General occupational health standards, chapter 296-62 WAC:

- ◆ The substance safety data sheet—benzene, found in WAC 296-62-07525, Appendix A.

- ◆ The substance technical guidelines—benzene, found in WAC 296-62-07527, Appendix B.

- ◆ The medical surveillance guidelines for benzene, found in WAC 296-62-07529, Appendix C;

**AND**

– A description of the medical evaluation requirements of this chapter found in:

- Medical evaluations, WAC 296-849-12030;

AND

- Medical removal, WAC 296-849-12050.

**Reference:** To see additional training and information requirements in other chapters, go to the:

- Respirators rule, chapter 296-842 WAC, and find the Training section, WAC 296-842-16005.
- Safety and health core rules, chapter 296-800 WAC, and find the section titled, Inform and train your employees about hazardous chemicals in your workplace, WAC 296-800-17030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-11050, filed 12/21/04, effective 3/1/05.]

### **WAC 296-849-11065 Exposure monitoring observation.**

#### **You must:**

(1) Provide affected employees and their designated representatives an opportunity to observe exposure monitoring during Step 6 of the exposure evaluation process found in Exposure evaluations, WAC 296-849-11030.

(2) Make sure observers who enter areas with benzene exposure:

- Are provided with and use the same protective clothing, respirators, and other personal protective equipment (PPE) that employees working in the area are required to use;

AND

- Follow safety and health requirements that apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-11065, filed 12/21/04, effective 3/1/05.]

### **WAC 296-849-11070 Notification.**

#### **You must:**

- Provide written notification of exposure monitoring results to the employees represented by your exposure evaluation within five business days after the monitoring results become known to you.

– In addition, when employee exposure monitoring results are above a permissible exposure limit (PEL), provide written notification of all of the following within fifteen business days after these exposure monitoring results become known to you:

- Corrective actions being taken and a schedule for completion;

AND

- Any reason why exposures cannot be lowered to below the PELs for benzene.

**Note:**

- You can notify employees either individually or post the notifications in areas readily accessible to affected employees.
- Posted notification may need specific information that allows affected employees to determine which monitoring results apply to them.
- Notification may be in any written form, such as handwritten or e-mail.
- Notification may be limited to the required information, such as exposure monitoring results.
- When notifying employees about corrective actions, your notification may refer them to a separate document that's available and provides the required information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-11070, filed 12/21/04, effective 3/1/05.]

[Title 296 WAC—p. 3004]

### **WAC 296-849-11090 Exposure records.**

#### **You must:**

- Establish and keep complete and accurate records for all exposure monitoring conducted under this chapter. Make sure the record includes at least:

– The name, Social Security number, or other unique identifier, and job classification of the employee sampled and all other employees represented by the sampled employee.

– The type of respirator worn, if any.

– A description of the methods used to obtain exposure monitoring results.

– A description of the procedure used to obtain representative employee exposure monitoring results.

– The date, number, duration, and the result of each sample taken.

**Note:** It is useful to record any personal protective equipment worn by the employee, in addition to the type of respirator worn.

#### **You must:**

- Keep exposure monitoring records for at least thirty years.

**Reference:**

- To see additional requirements for employee exposure records including access, and transfer requirements, go to another chapter, Employee medical and exposure records, chapter 296-802 WAC.
- Exposure monitoring records need to be kept longer than thirty years for employees participating in medical monitoring, go to Medical records, WAC 296-849-30080, found within this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-11090, filed 12/21/04, effective 3/1/05.]

### **WAC 296-849-120 Exposure and medical monitoring.**

#### **Summary:**

#### **Your responsibility:**

To detect any significant changes in employee health and exposure monitoring results.

#### **IMPORTANT:**

These sections apply when employee exposure monitoring results are either:

- At or above the action level (AL) of 0.5 parts per million (ppm) for benzene;

OR

- Above either of the permissible exposure limits for benzene.

#### **Contents**

Periodic exposure evaluations

WAC 296-849-12010.

Medical evaluations

WAC 296-849-12030.

Medical removal

WAC 296-849-12050.

Medical records

WAC 296-849-12080.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-120, filed 12/21/04, effective 3/1/05.]

### **WAC 296-849-12010 Periodic exposure evaluations.**

**Exemption:** Periodic exposure evaluations aren't required if exposure monitoring results conducted to fulfill requirements in Exposure evaluation, WAC 296-849-11030, are below the action level (AL) and short-term exposure limit (STEL).

**You must:**

• Obtain employee exposure monitoring results as specified in Table 3, by repeating Steps 3, 4, 6, and 7 of the exposure evaluation process found within this chapter, in Exposure evaluations, WAC 296-849-11030.

**Note:** If you document that one work shift consistently has higher exposure monitoring results than another for a particular operation, then you can limit sample collection to the work shift with higher exposures and use results to represent all employees performing the operation on other shifts.

**Table 3**  
**Periodic Exposure Evaluation Frequencies**

<b>If exposure monitoring results</b>	<b>Then</b>
<ul style="list-style-type: none"> <li>– Are between the: AL of 0.5 ppm <b>AND</b></li> <li>– Eight-hour time-weighted average (TWA<sub>8</sub>) of 1 ppm</li> </ul>	Conduct additional exposure evaluations at least every twelve months for the employees represented by the monitoring results.
Are above the TWA <sub>8</sub>	Conduct additional exposure evaluations at least every six months for the employees represented by the monitoring results.
<ul style="list-style-type: none"> <li>Have decreased to a concentration between the AL and TWA<sub>8</sub>;</li> <li><b>AND</b></li> <li>The decrease is demonstrated by two consecutive exposure evaluations, made at least seven days apart.</li> </ul>	You may <b>decrease</b> your evaluation frequency to every twelve months for employees represented by the monitoring results.
Are above the short-term exposure limit (STEL) of 5 ppm	Repeat as often as necessary to evaluate employee exposure.
<ul style="list-style-type: none"> <li>Have decreased to below the AL and the STEL</li> <li><b>AND</b></li> <li>The decrease is demonstrated by two consecutive evaluations, made at least seven days apart.</li> </ul>	You may <b>stop</b> periodic exposure evaluations for employees represented by the monitoring results.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 05-13-152, § 296-849-12010, filed 6/21/05, effective 8/1/05; 05-01-172, § 296-849-12010, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-12030 Medical evaluations.****IMPORTANT:**

Medical evaluations conducted under this section will satisfy the medical evaluation requirement found in Respirators, chapter 296-842 WAC.

**You must:**

• Provide the relevant medical follow-up specified in Tables 4 and 5 to any employee exposed to benzene during an emergency.

• Make medical evaluations available to current employees who meet the following criteria:

– Potential or actual exposure to benzene at or above the action level (AL) for at least thirty days in any twelve-month period.

– Potential or actual exposure to benzene at or above either permissible exposure limit (PEL) for at least ten days in a twelve-month period.

– Past exposure to concentrations above 10 ppm benzene for at least thirty days in a twelve-month period before November 11, 1988.

– Current or past work as a tire building machine operator using solvents containing more than 0.1% benzene during tire building operations.

**You must:**

• Make medical evaluations available at no cost to employees.

– Pay all costs, including travel costs and wages associated with any time spent outside of the employee's normal work hours;

• Make medical evaluations available at reasonable times and places;

• Make medical evaluations available by completing Steps 1 through 6 of the medical evaluation process for each employee covered.

**Note:**

• Employees who wear respirators need to be medically evaluated to make sure the respirator will not harm them, before they are assigned work in areas requiring respirators. Employees who decline to receive medical examination and testing to monitor for health effects caused by benzene are not excluded from receiving a separate medical evaluation for a respirator use.

• If employers discourage participation in medical monitoring for health effects caused by benzene, or in any way interfere with an employee's decision to continue with this program, this interference may represent unlawful discrimination under RCW 49.17.160, Discrimination against employee filing, instituting proceeding, or testifying prohibited—Procedure—Remedy.

**Helpful tool:**

**Declination form for nonemergency related medical evaluations.**

• You may use this optional form to document employee decisions to decline participation in the medical evaluation process for exposure to benzene.

**Medical evaluation process:**

**Step 1:** Identify employees who qualify, as stated above, for medical evaluations.

**Step 2:** Make medical evaluations available for employees identified in Step 1 at the following times:

• Initially, before the employee starts a job or task assignment where benzene exposure will occur.

• Every twelve months from the initial medical evaluation.

• Whenever the employee develops signs or symptoms commonly associated with toxic benzene exposure.

• After benzene exposure from an emergency.

**Step 3:** Select a licensed health care professional (LHCP) who will conduct or supervise medical evaluations and make sure:

• Individuals who conduct pulmonary function tests have completed a training course in spirometry sponsored by an appropriate governmental, academic, or professional institution, if they are not licensed physicians;

**AND**

- Your LHCP uses an accredited laboratory, such as one accredited by a nationally or state-recognized organization, to conduct laboratory tests.

**Step 4:** Make sure the LHCP receives all of the following before the medical evaluation is performed:

- A copy of:
  - This chapter.
  - The following information found in the General occupational health standards, chapter 296-62 WAC:
    - Appendix A, the substance safety data sheet—benzene, found in WAC 296-62-07525.
    - Appendix B, the substance technical guidelines—benzene, found in WAC 296-62-07527.
    - Appendix C, the medical surveillance guidelines for benzene, found in WAC 296-62-07529.
- A description of the duties of the employee being evaluated and how these duties relate to benzene exposure.
- The anticipated or representative exposure monitoring results for the employee being evaluated.
- A description of the personal protective equipment (PPE) each employee being evaluated uses or will use.
- Information from previous employment-related examinations when this information is not available to the examining LHCP.
- Instructions that the written opinions the LHCP provides, be **limited to** the following information:
  - Specific records, findings, or diagnosis relevant to the employee's ability to work around benzene.
  - The occupationally relevant results from examinations and tests.
  - A statement about whether or not medical conditions were found that would increase the employee's risk for impairment from exposure to benzene.
  - Any recommended limitations for benzene exposure.
  - Whether or not the employee can use respirators and any recommended limitations for respirator or other PPE use.
  - A statement that the employee has been informed of medical results and medical conditions caused by benzene exposure requiring further explanation or treatment.

**Step 5:** Provide the medical evaluation to the employee. Make sure it includes the content listed in Table 4, Content of medical evaluations, and Table 5, Medical follow-up requirements.

**Step 6:** Obtain the LHCP's written opinion for each employee's medical evaluation and give a copy to the employee within fifteen days of the evaluation date.

- Make sure the written opinion is limited to the information specified for written opinions in Step 4.

**Note:** If the written opinion contains specific findings or diagnoses unrelated to occupational exposure, send it back and obtain a revised version without the additional information.

**IMPORTANT:**

These tables apply when conducting medical evaluations, including medical follow-up for employees exposed to benzene during emergencies.

**Table 4**  
**Content of Medical Evaluations**

When conducting	Include
An initial evaluation	<ul style="list-style-type: none"> <li>• A detailed history including:                             <ul style="list-style-type: none"> <li>– Past work exposure to benzene or other hematological toxins;</li> <li>– Exposure to marrow toxins outside of current employment;</li> <li>– Exposure to ionizing radiation;</li> <li>– Family history of blood dyscrasias including hematological neoplasms;</li> <li>– History of blood dyscrasias including genetic hemoglobin abnormalities, bleeding abnormalities, and abnormal function of formed blood elements;</li> <li>– History of renal or liver dysfunction;</li> <li>– History of medications routinely taken.</li> </ul> </li> <li>• A complete physical examination:                             <ul style="list-style-type: none"> <li>– Include a pulmonary function test and specific evaluation of the cardiopulmonary system <b>if</b> the employee is required to use a respirator for at least thirty days a year.</li> </ul> </li> <li>• A complete blood count including a:                             <ul style="list-style-type: none"> <li>– Leukocyte count with differential;</li> <li>– Quantitative thrombocyte count;</li> <li>– Hematocrit;</li> <li>– Hemoglobin;</li> <li>– Erythrocyte count and indices (MCV, MCH, MCHC).</li> </ul> </li> <li>• Additional tests the examining LHCP determines are necessary based on alterations in the components of the blood or other signs that may be related to benzene exposure.</li> <li>• <b>Medical follow-up as required in Table 5.</b></li> </ul>
Annual evaluations	<ul style="list-style-type: none"> <li>• An updated medical history covering:                             <ul style="list-style-type: none"> <li>– Any new exposure to potential marrow toxins;</li> <li>– Changes in medication use;</li> <li>– Any physical signs associated with blood disorders.</li> </ul> </li> <li>• A complete blood count including a:</li> </ul>

When conducting	Include
	<ul style="list-style-type: none"> <li>– Leukocyte count with differential;</li> <li>– Quantitative thrombocyte count;</li> <li>– Hematocrit;</li> <li>– Hemoglobin;</li> <li>– Erythrocyte count and indices (MCV, MCH, MCHC).</li> <li>• Additional tests that the examining LHCP determines necessary, based on alterations in the components of the blood or other signs that may be related to benzene exposure.</li> <li>• A pulmonary function test and specific evaluation of the cardiopulmonary system every three years if the employee is required to use a respirator for at least thirty days a year.</li> <li>• <b>Medical follow-up as required in Table 5.</b></li> </ul>
Evaluations triggered by employee signs and symptoms commonly associated with the toxic effects of benzene exposure	<ul style="list-style-type: none"> <li>• An additional medical examination that addresses elements the examining LHCP considers appropriate.</li> </ul>
Evaluations triggered by employee exposure during an emergency	<ul style="list-style-type: none"> <li>• A urinary phenol test performed on the exposed employee's urine sample within seventy-two hours of sample collection.</li> <li>– The urine sample must be collected at the end of the work shift associated with the emergency;</li> <li>– The urine specific gravity must be corrected to 1.024.</li> <li>• <b>Medical follow-up as required in Table 5.</b></li> </ul> <p><b>Reference:</b> Employees who are not covered by medical evaluation requirements in this chapter may be covered by medical evaluation requirements in other chapters such as Emergency response, chapter 296-824 WAC.</p>

**Table 5**  
**Medical Follow-up Requirements**

If	Then
<ul style="list-style-type: none"> <li>• The <b>complete blood count test</b> result is normal.</li> </ul>	<ul style="list-style-type: none"> <li>• No further evaluation is required.</li> </ul>
<ul style="list-style-type: none"> <li>• The <b>complete blood count test</b> shows any of the following abnormal conditions: <ul style="list-style-type: none"> <li>– A leukocyte count less than 4,000 per mm<sup>3</sup> or an abnormal differential count;</li> </ul> </li> </ul> <p align="center"><b>OR</b></p> <ul style="list-style-type: none"> <li>– A thrombocyte (platelet) count that is either: <ul style="list-style-type: none"> <li>■ More than 20% below the employee's most recent values;</li> <li>■ Outside the normal limit (95% C.I.) according to the laboratory;</li> </ul> </li> <li>– The hematocrit or hemoglobin level is either of the following, and can not be explained by other medical reasons: <ul style="list-style-type: none"> <li>■ Below the normal limit (outside the 95% C.I.), as determined by the laboratory for the particular geographical area;</li> <li>■ Persistently decreasing compared to the employee's preexposure levels.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Repeat the complete blood count within two weeks: <ul style="list-style-type: none"> <li>– If the abnormal condition persists, refer the employee to a hematologist or an internist for follow-up medical examination and evaluation, unless the LHCP has good reason to believe it is unnecessary;</li> <li>– The hematologist or internist will determine what follow-up tests are necessary;</li> </ul> </li> </ul> <p align="center"><b>AND</b></p> <ul style="list-style-type: none"> <li>• Follow the requirements found in Medical removal, WAC 296-849-12050.</li> </ul>
Results from the <b>urinary phenol test</b> conducted during an emergency evaluation show phenol levels less than 75 mg/L.	<ul style="list-style-type: none"> <li>• No further evaluation is required.</li> </ul>

If	Then
<p>Results from the <b>urinary phenol test</b> conducted during an emergency evaluation show phenol levels equal or more than 75 mg/L.</p>	<ul style="list-style-type: none"> <li>• Provide a complete blood count monthly for three months. Include a:                             <ul style="list-style-type: none"> <li>– Leukocyte count with differential;</li> <li>– Thrombocyte count;</li> <li>– Erythrocyte count;</li> </ul> </li> <li><b>AND</b></li> <li>• If any of the abnormal conditions previously listed in this table for complete blood count results are found:                             <ul style="list-style-type: none"> <li>– Provide the employee with periodic examinations, if directed by the LHCP;</li> </ul> </li> <li><b>AND</b></li> <li>– <b>Refer the employee</b> to a hematologist or an internist for follow-up medical examination and evaluation unless the LHCP has good reason to believe a referral is unnecessary;</li> <li><b>AND</b></li> <li>– Follow the requirements found in Medical removal, WAC 296-849-12050;</li> <li><b>AND</b></li> <li>– The hematologist or internist will determine what follow-up tests are necessary.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-13-152, § 296-849-12030, filed 6/21/05, effective 8/1/05; 05-01-172, § 296-849-12030, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-12050 Medical removal.**

**IMPORTANT:**

This section applies when an employee is referred to a hematologist or an internist for follow-up medical examination and evaluation required in Table 5, Medical follow-up requirements found in Medical evaluations, WAC 296-849-12030.

**You must:**

(1) Remove the employee from areas where benzene exposure is above the action level (AL) by doing either of the following:

- Transfer the employee to a job currently available that:
  - The employee qualifies for, or could be trained for in a short period of time;

**AND**

– Will keep the employee's exposure to benzene as low as possible and never above the AL;

**OR**

- Remove the employee from the workplace until either:

– A job becomes available that:  
 ■ The employee qualifies for, or could be trained for in a short period of time;

**AND**

■ Will keep the employee's exposure to benzene as low as possible and never above the AL;

**OR**

– The employee is returned to work or permanently removed from benzene exposure as determined by completing the medical evaluation process for removed employees.

(2) Maintain the employee's current pay rate, seniority, and other benefits.

**Note:**

If you must provide medical removal benefits and the employee will receive compensation for lost pay from other sources, you may reduce your medical removal benefit obligation to offset the amount provided by these sources. Examples of other sources are:  
 • Public or employer-funded compensation programs;  
 • Employment by another employer, made possible by the employee's removal.

**You must:**

(3) Complete Steps 1 through 4 of the medical evaluation process for removed employees, **within six months** of the date the licensed health care professional (LHCP) refers an employee to a hematologist or internist for follow-up.

- Make sure all examinations and evaluations are provided at no cost to the employee.

– Make examinations and evaluations available at reasonable times and places;

**AND**

– Pay for travel costs and wages, including any time spent outside of the employee's normal work hours.

**Medical evaluation process for removed employees:**

**Step 1:** Make sure the following is provided to the hematologist or internist:

- The information you provided to the LHCP in Step 4 of Medical evaluations, WAC 296-849-12030;
- The employee's medical record as described in Medical records, WAC 296-849-12080.

**Note:**

The examining LHCP may provide this information for you.

**Step 2:** Provide the employee an examination and evaluation by a hematologist or internist.

- When the examination and evaluation is completed, you and the employee must be informed, in writing, of the referring LHCP's decision to continue **or** end the employee's removal from benzene exposure.

• Include the following in the LHCP's decision if removal of the employee continues:

- The expected time period for removal to continue;

**AND**

– Requirements for future medical examinations to review the decision.

• If the LHCP recommends the employee **end removal** and return to the usual job with benzene exposure, **skip Steps 3 and 4.**

**Step 3:** Provide further medical examination and evaluation to the employee when the LHCP's decision from Step 2 informs you that medical removal must continue.

**Note:**

• During this step the LHCP, in consultation with the hematologist or internist, decides whether the employee:  
 – May return to their usual job;

**OR**

- Should be permanently removed from exposures that exceed the AL.
- If the LHCP recommends the employee return to their usual job, skip Step 4.

**Step 4:** When the LHCP recommends permanent removal for the employee, make sure all the following conditions are met:

- The employee has an opportunity to transfer to another job that is currently available (or will become available);
- The job is one the employee qualifies for, or could be trained for in a short period of time;
- There is no reduction in the employee's current pay rate, seniority, and other benefits;
- The employee's benzene exposures will be as low as possible, but never more than the AL.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-12050, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-12080 Medical records.**

**IMPORTANT:**

This section applies when a medical evaluation is performed, or any time a medical record is created for an employee exposed to benzene.

**You must:**

- Establish and maintain complete and accurate medical records for each employee receiving a medical evaluation and make sure the records include **all** the following:
  - The employee's name and Social Security number, or other unique identifier;
  - A copy of the licensed health care professional's (LHCP's) written opinions including written decisions and recommendations for the employee removed from exposure;
  - A copy of the information required in Step 4 of the medical evaluation process, found in WAC 296-849-12030, **except** for the copy of this chapter and the appendices listed.
- Maintain medical evaluation records for the duration of employment plus thirty years.

**Note:** Your medical provider may keep these records for you. Other medical records such as an employee's medical history, need to be kept as a confidential record by the medical provider and accessed only with the employee's consent.

**Reference:** To see additional employee medical record requirements, including access and transfer requirements, go to another chapter. Employee medical and exposure records, chapter 296-802 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-12080, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-130 Rules for exposure control areas.**

**Summary:**

**Your responsibility:**

To protect employees from exposure to benzene by using feasible exposure controls and appropriate respirators.

**IMPORTANT:**

These sections apply when existing or potential employee exposure monitoring results are above either of the following permissible exposure limits (PELs):

- The eight-hour time-weighted average (TWA<sub>8</sub>) of 1 part per million (ppm);
- OR**
- The fifteen-minute short-term exposure limit (STEL) of 5 ppm.

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**Contents:**

- Exposure control plan  
WAC 296-849-13005.
- Exposure controls  
WAC 296-849-13020.
- Respirators  
WAC 296-849-13045.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-130, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-13005 Exposure control plan.**

**Exemption:** This section does not apply to the cleaning and repair of barges and tankers that contained benzene.

**You must:**

- Establish and implement a written exposure control plan for exposure control areas that include a schedule for developing and implementing feasible exposure controls to reduce benzene exposure to, or below, the PELs.

**Reference:** To see examples of exposure controls, go to Respiratory hazards, chapter 296-841 WAC, and find Table 1 in Control employee exposure, WAC 296-841-20010.

**Note:** Respirators and other personal protective equipment (PPE) help protect employees from exposures, but are **not** substitutes for feasible exposure controls.

**You must:**

- Review and update your exposure control plan as needed, based on the most recent exposure evaluation results.
- Provide a copy of your exposure control plan to affected employees and their designated representatives when they ask to review or copy it.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-13005, filed 12/21/04, effective 3/1/05.]

**WAC 296-849-13020 Exposure controls.**

**IMPORTANT:**

Respirators and other personal protective equipment (PPE) do **not** substitute for feasible exposure controls.

**You must:**

- Use feasible exposure controls to reduce exposures, as specified in Table 6.

**Reference:** To see examples of exposure controls, go to Respiratory hazards, chapter 296-841 WAC, and find Table 1 in Control employee exposures, WAC 296-841-20010.

**Table 6  
Exposure Control Requirements**

<b>If:</b>	<b>Then you must use feasible controls to:</b>
You have operations where employees clean and repair barges or tankers which have contained benzene	Keep all employee exposure concentrations below 10 parts per million (ppm).
You can document that benzene is used for less than thirty days a year in the workplace	Reduce eight-hour employee exposure monitoring results to a time-weighted average of 10 ppm or less.
	<b>Note:</b>

If:	Then you must use feasible controls to:
	If employee exposure monitoring results are between 1 and 10 ppm, you are permitted to use respirators or a combination of respirators and feasible controls to protect employees.
Employees are exposed to benzene above a PEL for at least thirty days a year	Reduce eight-hour employee exposure concentrations to the TWA <sub>8</sub> of 1 ppm or less; <b>AND</b> Reduce fifteen-minute employee exposure concentrations to the STEL of 5 ppm or less.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-13020, filed 12/21/04, effective 3/1/05.]

### WAC 296-849-13045 Respirators.

#### IMPORTANT:

These requirements are in addition to the requirements found in other chapters:

- Respiratory hazards, chapter 296-841 WAC;
- Respirators, chapter 296-842 WAC.

#### You must:

• Provide respirators and require that employees use them in circumstances where exposure is above either permissible exposure limit (PEL) for benzene, including any of the following circumstances:

- Employees are in an exposure control area;
- Feasible exposure controls are being put in place;
- Where you determine that exposure controls are not feasible;

– Feasible exposure controls do not reduce exposures to, or below, a PEL;

– Emergencies.

• Meet these requirements to protect employees from benzene exposure above a PEL:

– Limit selection of escape respirators to either:

- A full-facepiece organic vapor gas mask;

**OR**

■ A full-facepiece self-contained breathing apparatus (SCBA);

**OR**

■ A hood-style SCBA that operates in positive-pressure mode.

• Make sure respirator cartridges or canisters are replaced at the beginning of each work shift, or sooner if their service life has expired.

• Make sure canisters on gas masks and powered air-purifying respirators (PAPRs) have a minimum service life of four hours when tested under these conditions:

- A benzene concentration of 150 ppm;
- A temperature of 25°C;
- A relative humidity of 85%;
- A flow rate of one of the following:

■ 64 liters per minute (lpm) for nonpowered air-purifying respirators;

■ 115 lpm for **tight-fitting** PAPRs;

■ 170 lpm for **loose-fitting** PAPRs.

• Provide an employee a respirator with low breathing resistance, such as a PAPR or an air-line respirator when the:

– Employee cannot use a negative-pressure respirator;

**AND**

– A licensed health care professional's (LHCP's) written opinion allows this type of respirator.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-13-152, § 296-849-13045, filed 6/21/05, effective 8/1/05; 05-01-172, § 296-849-13045, filed 12/21/04, effective 3/1/05.]

### WAC 296-849-190 Definitions.

**Action level** an airborne concentration of benzene of 0.5 parts per million (ppm) calculated as an eight-hour time-weighted average.

**Authorized personnel** individuals specifically permitted by the employer to enter the exposure control area to perform necessary duties, or to observe employee exposure evaluations as a designated representative.

**Benzene** liquid benzene, benzene vapor, and benzene in liquid mixtures and the vapors released by these liquids.

The chemical abstract service (CAS) registry number for benzene is 71-43-2. CAS numbers are internationally recognized and used on material safety data sheets (MSDSs) and other documents to identify substances. For more information see <http://www.cas.org/about>.

**Breathing zone** the space around and in front of an employee's nose and mouth, forming a hemisphere with a 6- to 9-inch radius.

**Bulk wholesale storage facility** any bulk terminal or bulk plant where fuel is stored before its delivery to wholesale customers.

**Container** any container, except for pipes or piping systems, that contains benzene. It can be any of the following:

- Barrel;
- Bottle;
- Can;
- Cylinder;
- Drum;
- Reaction vessel;
- Storage tank.

**Day** any part of a calendar day.

**Designated representative** any of the following:

• Any individual or organization to which an employee gives written authorization;

• A recognized or certified collective bargaining agent without regard to written employee authorization;

**OR**

• The legal representative of a deceased or legally incapacitated employee.

**Emergency** any event that could or does result in the unexpected significant release of benzene. Examples of emergencies include equipment failure, container rupture, or control equipment failure.

**Exposure** the contact an employee has with benzene, whether or not protection is provided by respirators or other personal protective equipment (PPE). Contact can occur

through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

**Licensed health care professional (LHCP)** an individual whose legally permitted scope of practice allows him or her to provide some or all of the health care services required for medical evaluations.

**Permissible exposure limits (PELs)** PELs are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are also specified in various WISHA rules found in other chapters. The PELs for benzene are the:

- Eight-hour time-weighted average (TWA<sub>8</sub>) of 1 part per million (ppm);

**AND**

- Fifteen-minute short-term exposure limit (STEL) of 5 ppm.

**Short-term exposure limit (STEL)** an exposure limit averaged over a fifteen-minute period that must not be exceeded during any part of an employee's workday.

**Time-weighted average (TWA<sub>8</sub>)** an exposure limit averaged over an eight-hour period that must not be exceeded during an employee's workday.

**Vapor control systems** equipment that controls the vapor displaced when chemicals are loaded and unloaded from truck or storage tanks. It also processes or balances the vapor back into the truck or storage tanks.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-172, § 296-849-190, filed 12/21/04, effective 3/1/05.]

**Chapter 296-855 WAC  
ETHYLENE OXIDE**

**WAC**

296-855-100	Scope.
296-855-200	Basic rules.
296-855-20010	Preventive practices.
296-855-20020	Exposure control areas.
296-855-20040	Personal protective equipment (PPE).
296-855-20050	Exposure evaluations.
296-855-20060	Notification.
296-855-20070	Exposure records.
296-855-20080	Documentation records.
296-855-20090	Training.
296-855-300	Exposure and medical monitoring.
296-855-30010	Periodic exposure monitoring.
296-855-30030	Medical evaluations.
296-855-30080	Medical records.
296-855-400	Exposure control.
296-855-40010	Exposure control plan.
296-855-40030	Exposure controls.
296-855-40040	Respirators.
296-855-500	Definitions.

**WAC 296-855-100 Scope.** This chapter applies to all occupational exposure to ethylene oxide.

**Definition:**

- *Ethylene oxide* (EtO) is an organic chemical represented by the Chemical Abstract Service (CAS) registry number 75-21-8. It is a flammable colorless gas that is commonly used to sterilize medical equipment and as a fumigant for certain agricultural products. It is also used as an intermediary in the production of various chemicals such as ethylene glycol, automotive antifreeze, and polyethylene.

- *Exposure* is the contact an employee has with EtO, whether or not protection is provided by respirators or other

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personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, or skin and eye contact.

Some of the requirements in this chapter may not apply to every workplace with an occupational exposure to EtO. The following steps will show which requirements apply to your workplace based on employee exposure monitoring results.

**Step one:** Follow requirements in the basic rules section, WAC 296-855-20010 through 296-855-20090.

**Step two:** Use employee exposure monitoring results from the exposure evaluations required by, Exposure evaluations, WAC 296-855-20050, and follow Table 1 to find out which additional sections of this chapter apply to your workplace.

**Step three:** You need only follow Exposure records, WAC 296-855-20070 and Medical records, WAC 296-855-30080 if you have documentation conclusively demonstrating that employee exposure for ethylene oxide and the operation where it's used, cannot exceed the AL or STEL during any conditions reasonably anticipated.

- Such documentation can be based on observations, data, calculations, and previous air monitoring results.

**Table 1  
Sections That Apply to Your Workplace**

<b>If:</b>	<b>Then continue to follow the basic rules, and the additional requirements in:</b>
Employee exposure monitoring results are below the AL and STEL	No additional requirements if exposures remain stable
Employee exposure monitoring results are above the PELs  Note: PEL refers to both the STEL and TWA	<ul style="list-style-type: none"> <li>• Exposure and medical monitoring, WAC 296-855-30010 through 296-855-30080;</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>• Exposure control, WAC 296-855-40005 through 296-855-40045</li> </ul>
Employee exposure monitoring results are above the AL; <b>AND</b> Below the STEL	Exposure and medical monitoring, WAC 296-855-30010 through 296-855-30080
When there is a possibility of an emergency release of EtO	Establish a written emergency response plan and a means of alerting potentially exposed employees as found in Exposure control plan, WAC 296-855-40005

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-100, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-200 Basic rules.****Summary:****Your responsibility:**

To evaluate employee exposure and protect employee from ethylene oxide.

**IMPORTANT:**

• The requirements in basic rules apply to all employers covered by the scope of this chapter, WAC 296-855-100. Additional sections may apply to you, based on employee exposure monitoring results. Turn to the Scope, WAC 296-855-100, and follow Table 1.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-200, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-20010 Preventive practices.****You must:**

• Make sure that all containers of EtO whose contents are capable of causing employee exposure above the action level or above the STEL are labeled, tagged, or marked with this warning:

**Danger**  
**Contains Ethylene Oxide**  
**Cancer Hazard and Reproductive Hazard**

**AND**

A warning stating that breathing airborne concentrations of EtO is hazardous.

• Keep container labels free of statements that contradict or detract from the labels' hazard warning.

**Note:** • EtO is highly flammable and should be kept in a tightly covered container, and in a cool, well-ventilated area away from any type of ignition source.

**You must:**

• Make sure warning labels remain on containers of EtO when these containers are transported.

**Exemption:** • Reaction vessels, storage tanks, and pipes or piping systems are not considered to be containers and do not require labeling.  
• Labeling requirements do not apply when EtO:  
– Is used as a pesticide as defined by the Federal Insecticide, Fungicide, and Rodenticides Act (7 U.S.C. 136 et seq.);  
**AND**  
– Meets the Environmental Protection Agency labeling requirements for pesticides.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20010, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-20020 Exposure control areas.****You must:**

• Establish temporary or permanent exposure control areas where airborne concentrations of ethylene oxide (EtO) exceed or could exceed the permissible exposure limits (PELs) by doing all the following:

– Clearly identify the boundaries of exposure control areas in any way that minimizes employee access.

– Post signs at access points to exposure control areas that:

■ Are easy to read (for example, they are kept clean and well lit).

**AND**

■ Include this warning:

**DANGER**  
**ETHYLENE OXIDE**  
**CANCER AND REPRODUCTIVE HAZARD**  
**AUTHORIZED PERSONNEL ONLY**  
**RESPIRATORS AND PROTECTIVE CLOTHING MAY BE**  
**REQUIRED TO BE WORN IN THIS AREA**

• Keep signs and areas near them free of statements that contradict or detract from their message.

**Note:** • This requirement does not prevent you from posting other signs.

**You must:**

• Allow only authorized personnel to enter exposure control areas.

**Note:** • When identifying the boundaries of exposure control areas you should consider factors such as:  
– The level and duration of airborne exposure.  
– Whether the area is permanent or temporary.  
– The number of employees in adjacent areas.  
• You may use permanent or temporary enclosures, caution tape, ropes, painted lines on surfaces, or other materials to visibly distinguish exposure control areas or separate them from the rest of the workplace.

**You must:**

• Make sure employees entering exposure control areas have appropriate respirators available for use.

• Prevent all of the following activities from occurring in exposure control areas:

– Eating food.

– Drinking beverages.

– Smoking.

– Chewing tobacco or gum.

– Applying cosmetics.

– Storing food, beverages, or cosmetics.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20020, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-20040 Personal protective equipment (PPE).****You must:**

• Make sure employees wear appropriate PPE as protection from skin or eye contact with ethylene oxide (EtO), liquid EtO, or EtO solutions.

• Provide appropriate PPE at no cost to employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20040, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-20050 Exposure evaluations.****IMPORTANT:**

This section applies when there is a potential for airborne exposure to ethylene oxide (EtO) in your workplace.

When you conduct an exposure evaluation in a workplace where an employee uses a respirator, the protection provided by the respirator is not considered.

Following this section will also meet the requirements to identify and evaluate respiratory hazards found in another chapter, Respiratory hazards, chapter 296-841 WAC.

**You must:**

• Conduct an employee exposure evaluation to accurately determine airborne concentrations of EtO by completing Steps one through seven of the exposure evaluation process, each time any of the following apply:

– No evaluation has been conducted.

– Changes have occurred in any of the following areas that may result in new or increased employee exposures:

- Production.
- Processes.
- Personnel.

■ Exposure controls such as ventilation systems or work practices.

– You have any reason to suspect new or increased employee exposure may occur.

• Provide affected employees and their designated representatives an opportunity to observe any exposure monitoring during Step six of the exposure evaluation process.

• Make sure observers entering areas with EtO exposure:
 

- Are provided with and use the same protective clothing, respirators, and other personal protective equipment (PPE) that employees working in the area are required to use;

**AND**

– Follow all safety and health requirements that apply.

#### **Exposure evaluation process**

**Step one:** Identify all employees who have potential exposure to airborne ethylene oxide (EtO) in your workplace.

**Step two:** Identify operations where employee exposures could exceed EtO's fifteen-minute short-term exposure limit (STEL) of five parts per million (ppm).

**Step three:** Select employees from those working in the operations you identified in Step two who will have their STEL exposures measured.

**Step four:** Select employees from those identified in Step one who will have their eight-hour exposures monitored.

• Make sure the exposures of the employees selected represent eight-hour exposures for all employees identified in Step one including each job classification, work area, and shift.

• If you expect all employee exposures to be below the action level (AL), you can choose to limit your selection to those employees reasonably believed to have the highest exposures. If you find these employees' exposure to be above the AL, then you'll need to repeat Step four to represent all employees identified in Step one.

**Note:** You can use Steps three through six of this process to create a written description of the procedure used for obtaining representative employee exposure monitoring results, which is a requirement in Exposure records, WAC 296-855-20070.

**Exemption:** • You can skip Steps four through seven if you have documentation conclusively demonstrating that employee exposure for a particular material and the operation where it's used, cannot exceed the AL or STEL during any conditions reasonably anticipated.

• Such documentation can be based on observations, data, calculations, and previous air monitoring results. Previous air monitoring results:

- Must meet the accuracy required by Step five.
- May be from outside sources, such as industry or labor studies.
- Must be based on data that represents conditions being evaluated in your workplace.

**Step five:** Determine how you will obtain accurate employee exposure monitoring results. Select and use an air monitoring method with a confidence level of ninety-five percent, that's accurate to:

- ± twenty-five percent when concentrations are potentially above the AL or eight-hour time-weighted average of one part per million (ppm).
- ± thirty-five percent when concentrations are potentially above the AL of 0.5 ppm or the STEL of five ppm.

**Note:** Here are examples of air monitoring methods that meet this accuracy requirement:

- OSHA Method thirty found by going to: <http://www.osha.gov/dts/sltc/methods/toc.html>.
- NIOSH Method thirty eight hundred found by going to: <http://www.cdc.gov/niosh/homepage.html> and linking to the NIOSH Manual of analytical methods.

**Step six:** Obtain employee monitoring results by collecting air samples representing employees identified in Steps three and four.

• Collect STEL samples for employees and operations selected in Step three.

• Collect samples representing the eight-hour exposure, for at least one shift, for each employee selected in Step four.

• Make sure samples are collected from each selected employee's breathing zone.

**Note:** • You may use any sampling method that meets the accuracy specified in Step five. Examples of these methods include:

– Real-time monitors that provide immediate exposure monitoring results.

– Equipment that collects samples that are sent to a laboratory for analysis.

• The following are examples of methods for collecting samples representative of eight-hour exposures.

– Collect one or more continuous samples, such as a single eight-hour sample or four two-hour samples.

– Take a minimum of five brief samples, such as five fifteen-minute samples, during a work shift at randomly selected times.

• For work shifts longer than eight hours, monitor the continuous eight-hour portion of the shift expected to have the highest average exposure concentration.

**Step seven:** Have the samples you collected analyzed to obtain monitoring results for eight-hour and STEL exposures.

• Determine if employee exposure monitoring results are above or below the following values:

– Eight-hour time-weighted average (TWA<sub>8</sub>) of one ppm.

– Fifteen-minute short-term exposure limit (STEL) of five ppm.

– Eight-hour action level (AL) of 0.5 ppm.

**Note:** • You may contact your local WISHA consultant for help:
 

- Interpreting data or other information.
- Determining eight-hour or fifteen-minute employee exposure monitoring results.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20050, filed 8/23/05, effective 1/1/06.]

#### **WAC 296-855-20060 Notification.**

##### **You must:**

• Provide written notification of exposure monitoring results to employees represented by your exposure evaluation, within five business days after monitoring results become known to you.

• In addition, when employee exposure monitoring results are above either the TWA<sub>8</sub> or STEL permissible exposure limit (PEL), provide written notification of all the following within fifteen business days after the results become known to you:

– Corrective actions being taken and a schedule for completion;

**AND**

– Any reason why exposures can not be lowered to below the PELs.

- Note:**
- You can either notify employees individually or post the notifications in areas readily accessible to affected employees.
  - Posted notification may need specific information that allows affected employees to determine which monitoring results apply to them.
  - Notification may be:
    - In any written form, such as hand-written or e-mail.
    - Limited to the required information, such as exposure monitoring results.
  - When notifying employees about corrective actions, your notification may refer them to a separate document that is available and provides the required information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20060, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-20070 Exposure records.****You must:**

• Establish and keep complete and accurate records for all exposure monitoring evaluations conducted under this chapter. Make sure the record includes, at least:

- The name, unique identifier, and job classification of:
  - The employee sampled;

**AND**

■ All other employees represented by the sampled employee.

– A description of the methods used to obtain exposure monitoring results and evidence of the methods' accuracy.

– The operation being monitored for employee exposure to EtO.

– A description of the procedure used to obtain representative employee exposure monitoring results.

– The date, number, duration, location, and the result of each sample taken.

– Any environmental conditions that could affect exposure concentration measurements.

– Any personal protective equipment (PPE) worn by the employee including the type of respirator.

- Note:**
- You can use Steps three through six of the exposure evaluation process in Exposure evaluations, WAC 296-855-20050, to create a description of the procedure you used for obtaining representative employee exposure monitoring results.

**You must:**

• Keep exposure monitoring records for at least thirty years.

- Reference:**
- To see additional requirements for employee exposure records including access, and transfer requirements, go to another chapter, Employee medical and exposure records, chapter 296-802 WAC.
  - Exposure monitoring records need to be kept longer than thirty years for employees participating in medical monitoring, go to Medical records, WAC 296-849-12080.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20070, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-20080 Documentation records.****You must:**

• Keep documentation you develop, of the processing, use, or handling of products made from or containing EtO,

[Title 296 WAC—p. 3014]

that conclusively demonstrates that the action level or STEL for EtO cannot be exceeded under any foreseeable conditions of use.

- Include the following in the documentation record:
  - The product that is the subject of the documentation;
  - The source of the data;
  - Any testing protocol, results of testing, and/or analysis of the product for the release of EtO;
  - A description of the operation where the product is used and how the data support your conclusion; and
  - Other data relevant to the operations, materials, processing, or employee exposures covered by your conclusion.
- Maintain the documentation record for as long as you rely on your conclusion that the action level and STEL cannot be exceeded.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20080, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-20090 Training.****You must:**

• Train employees who are potentially exposed above the:

- Action level (AL) 0.5 parts per million (ppm);

**OR**

– Fifteen-minute short-term exposure limit (STEL) of five ppm.

- Provide training:

- At the time of initial assignment;

**AND**

- Then at least every twelve months.

• Make sure training and information includes all of the following:

- The requirements of this chapter.

- The location and availability of this chapter.

– The purpose of medical evaluations and a description of your medical evaluation program required in Medical evaluations, WAC 296-855-30030 in this chapter.

– Monitoring procedures and observations to detect the presence or release of EtO.

- The physical and health hazards of EtO.

– Actions employees can take to protect themselves from EtO exposure such as work practices, emergency procedures, and PPE.

– The details of your hazard communication program required by another chapter, Employer chemical hazard communication, WAC 296-800-170.

– Operations in employee work areas where EtO is present.

– The following information found in the General occupational health standards, chapter 296-62 WAC:

■ The Substance safety data sheet, WAC 296-62-07383 Appendix A.

■ The Substance technical guidelines, WAC 296-62-07385 Appendix B.

■ Medical surveillance guidelines, WAC 296-62-07387 Appendix C.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-20090, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-300 Exposure and medical monitoring.**

**Summary:**

**Your responsibility:**

To monitor employee health and workplace exposures to ethylene oxide (EtO).

**IMPORTANT:**

- These sections apply when employee exposure monitoring results are either above the:

- Action level (AL) of 0.5 parts per million (ppm);

**OR**

- Short-term exposure limit (STEL) of five ppm.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-300, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-30010 Periodic exposure monitoring.**

**Exemption:** Periodic employee exposure monitoring is not required if exposure monitoring results conducted to fulfill requirements in Exposure evaluation, WAC 296-855-20050, are below the action level (AL).

**You must:**

- Obtain employee exposure monitoring results according to the frequency specified in Table 2, Periodic Exposure Evaluation Frequencies.

**Note:** • If you documented that one work shift consistently has higher exposure monitoring results than another for a particular operation, then you may limit sample collection to the work shift with higher exposures and use those results to represent all employees performing the operation on other shifts.

**Table 2**

**Periodic Exposure Evaluation Frequencies**

<b>If employee exposure monitoring results:</b>	<b>Then:</b>
Are between the: • Action level (AL) of 0.5 parts per million (ppm); <b>AND</b> •TWA <sub>8</sub> of 1 ppm	Conduct additional exposure monitoring at least every 6 months.
Are above the TWA <sub>8</sub> ; <b>OR</b> Above the STEL	Conduct additional exposure monitoring at least every 3 months.
Have been obtained at least every 3 months; <b>AND</b> Have 2 consecutive monitoring results, taken at least 7 days apart, showing 8-hour employee exposure monitoring results that have dropped below the TWA <sub>8</sub> , but remain at or above the AL	You may <b>decrease</b> your evaluation frequency for the TWA <sub>8</sub> to every 6 months.
Have 2 consecutive evaluations, taken at least 7 days apart, showing 8-hour employee exposure monitoring results that have dropped below the AL and STEL	You may <b>stop</b> periodic exposure evaluations.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-30010, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-30030 Medical evaluations.**

**IMPORTANT:**

Medical evaluations meeting all requirements of this section will fulfill the medical evaluation requirement found in another chapter, Respirators, chapter 296-842 WAC.

Employees who wear respirators need to be medically evaluated to make sure the respirator will not harm them, before they are assigned work in areas requiring respirators.

**You must:**

- Make medical evaluations available to current employees:

- Who have been, are, or may be exposed above the action level (AL) for at least thirty days in any twelve-month period.

- Exposed to EtO during an emergency situation.

- Wanting medical advice on EtO exposure and reproductive health.

- Whenever the employee develops signs and symptoms commonly associated with ethylene oxide.

- At no cost including travel costs and wages associated with any time spent obtaining the medical evaluation.

- At reasonable times and places.

- Complete Steps one through four of the medical evaluation process at the following times:

- Initially, when employees are assigned to work in an area where exposure monitoring results are, or will likely be, above the action level (AL) for at least thirty days in a twelve-month period.

- Every twelve months for employees exposed above the AL for at least thirty days in the preceding year unless the examining physician determines that they should be provided more frequently.

- When employment with exposure ends, if the employee has not had an evaluation within the six-month period before exposure ends.

**Note:** • Employees who decline to receive medical examination and testing to monitor for health effects caused by EtO are not excluded from receiving a separate medical evaluation for respirator use.

• If employers discourage participation in medical monitoring for health effects caused by EtO, or in any way interfere with an employee's decision to continue with this program, this interference may represent unlawful discrimination under RCW 49.17.160, Discrimination against employee filing complaint, instituting proceedings, or testifying prohibited—Procedure—Remedy.

**Helpful tool: Declination form for nonemergency related medical evaluations**

You may use this optional form to document employee decisions to decline participation in the medical evaluation process for exposure to ethylene oxide (EtO). To see this form, go to the resources section within this chapter.

**Medical evaluation process**

**Step one:** Select an appropriate licensed health care professional (LHCP) who will conduct or supervise examinations and procedures.

- If the LHCP is not a licensed physician, make sure individuals who conduct pulmonary function tests have completed a training course in spirometry sponsored by an appropriate governmental, academic, or professional institution.

[Title 296 WAC—p. 3015]

- Step two:** Make sure the LHCP receives all of the following information before the medical evaluation is performed:
- A copy of:
    - This chapter.
    - The following information found in the General occupational health standards, chapter 296-62 WAC:
      - The Substance safety data sheet, WAC 296-62-07383(1) Appendix A.
      - The Substance technical guidelines, WAC 296-62-07385(2) Appendix B.
      - Medical surveillance guidelines, WAC 296-62-07387(3) Appendix C.
  - A description of the duties of the employee being evaluated and how these duties relate to EtO exposure.
  - The anticipated or representative exposure monitoring results for the employee being evaluated.
  - A description of the personal protective equipment (PPE) and respirators each employee being evaluated uses or will use.
  - Information from previous employment-related examinations when this information is not available to the examining LHCP.
  - Instructions that the written opinions the LHCP provides you be limited to the following information:
    - Whether or not medical conditions were found that would increase the employee's risk for impairment from exposure to EtO.
    - Any recommended limitations for EtO exposure and use of respirators or other PPE.
    - A statement that the employee has been informed of medical results and medical conditions caused by EtO exposure requiring further examination or treatment.
- Step three:** Make medical evaluations available to the employee. Make sure they include the content listed in Table 3, Content of Medical Evaluations.
- Step four:** Obtain the LHCP's written opinion for the employee's medical evaluation and make sure the employee receives a copy within five business days after you receive the written opinion.
- Make sure the written opinion is limited to the information specified for written opinions in Step two.
- Note:**
- If the written opinion contains specific findings or diagnoses unrelated to occupational exposure, send it back and obtain a revised version without the additional information.

**Table 3**  
**Content of Medical Evaluations**

<b>When conducting:</b>	<b>Include:</b>
An initial and annual evaluation	<ul style="list-style-type: none"> <li>• A work history and medical history that includes emphasis on:                             <ul style="list-style-type: none"> <li>– Pulmonary, hematological, neurological, reproductive systems;</li> </ul> </li> <li><b>AND</b></li> <li>– The eyes and skin.</li> <li>• A physical examination that includes emphasis on:</li> </ul>

**Table 3**  
**Content of Medical Evaluations**

<b>When conducting:</b>	<b>Include:</b>
	<ul style="list-style-type: none"> <li>– Pulmonary, hematological, neurological, and reproductive systems;</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>– The skin and eyes.</li> <li>• A complete blood count including a:                             <ul style="list-style-type: none"> <li>– White cell count with differential</li> <li>– Red cell count</li> <li>– Hematocrit</li> <li>– Hemoglobin.</li> </ul> </li> <li>• Additional examinations the licensed health care professional (LHCP) believes appropriate based on the employee's exposure to ethylene oxide (EtO) or respirator use.</li> <li>• Additional testing:                             <ul style="list-style-type: none"> <li>– Pregnancy test, and laboratory evaluation for fertility if requested by employee and approved by evaluating LHCP.</li> </ul> </li> </ul>
Evaluations due to termination of employment	<ul style="list-style-type: none"> <li>• The same content as specified for initial and annual evaluations.</li> </ul>
Evaluations due to reassignment to an area where EtO exposure is below the AL	<ul style="list-style-type: none"> <li>• The same content as specified for initial and annual evaluations.</li> <li>• As determined by the LHCP.</li> </ul>
Evaluations due to exposure during an emergency	<ul style="list-style-type: none"> <li>• The same content as specified for initial and annual evaluations.</li> </ul>
Evaluations triggered by employee signs and symptoms commonly associated with overexposure to EtO or a request for reproductive advice	<ul style="list-style-type: none"> <li>• The content of medical examinations and consultations will be determined by the examining LHCP.                             <ul style="list-style-type: none"> <li>– Pregnancy test, and laboratory evaluation for fertility if requested by employee and approved by evaluating LHCP.</li> </ul> </li> </ul>
Evaluations determined necessary by LHCP for exposed employees	<ul style="list-style-type: none"> <li>• The content of medical examinations and consultations will be determined by the examining LHCP.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-30030, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-30080 Medical records.**

**IMPORTANT:**

This section applies when a medical evaluation is performed, or any time a medical record is created for an employee exposed to ethylene oxide (EtO).

**You must:**

- Establish and maintain complete and accurate medical records for each employee receiving a medical evaluation for EtO and make sure the records include all the following:
  - The employee's name and unique identifier.
  - Any employee medical complaints related to EtO.
  - A description of the employee's duties.
  - A copy of the licensed health care professional's (LHCP's) written opinions.
  - The anticipated or representative employee exposure monitoring results provided to the LHCP for the employee.
  - A copy of the information required in Step two of the medical evaluation process, found in WAC 296-855-30030, except the copy of this chapter and the appendices.
- Maintain medical records for the duration of employment plus thirty years.

**Note:** • Your medical provider may keep these records for you. Other medical records, such as the employee's medical history or X rays, need to be kept as confidential records by the medical provider.

**Reference:** For additional requirements that apply to employee exposure records including access and transfer requirements, go to, Employee medical and exposure records, chapter 296-802 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-30080, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-400 Exposure control.****Summary:****Your responsibility:**

To protect employees from exposure to ethylene oxide (EtO) by using feasible exposure controls and appropriate respirators.

**IMPORTANT:**

- These sections apply when employee exposure monitoring results are above either of the following permissible exposure limits (PELs):
  - The eight-hour time-weighted average ( $TWA_8$ ) of one part per million (ppm);

**OR**

- The fifteen-minute short-term exposure limit (STEL) of five ppm.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-400, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-40010 Exposure control plan.****You must:**

- Establish and implement a written exposure control plan to reduce employee exposure to EtO below both  $TWA_8$  and the STEL by the use of feasible exposure controls. Include at least the following in your plan:
  - A schedule for periodic leak detection surveys.
  - Make sure employee rotation is not included as a method to control employee exposure.
- Establish a written plan for emergency situations for each work area where there is a possibility of an emergency from a release of EtO. The plan must include, at a minimum:
  - Emergency escape:
    - Procedures.
    - Route assignments.

(2007 Ed.)

- Emergency evacuation plans and procedures to account for all employees after emergency evacuation has been completed.

- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate.

- Requirements for the use of respiratory protection as required in WAC 296-855-40045.

- Rescue and medical duties for those employees who will perform them.

- The preferred means of reporting fires and other emergencies.

- Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan.

- Establish an employee alarm system that meets the requirements of Employee alarm systems, WAC 296-800-31070 in the safety and health core rules.

- The employee alarm system must be distinctive and recognizable as a signal to perform actions designated under the emergency response plan.

- Review your exposure control plan at least every twelve months and update as needed to reflect your current workplace conditions.

- Provide a copy of your exposure control plan to affected employees and their designated representatives, when they ask to review or copy it.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-40010, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-40030 Exposure controls.****IMPORTANT:**

The use of an employee rotation schedule to control employee exposure to ethylene oxide (EtO) is prohibited.

Respirators and other personal protective equipment (PPE) are not exposure controls.

**You must:**

- Use feasible exposure controls to:
  - Reduce exposure to, or below, the permissible exposure limit (PELs);

**OR**

- To reduce exposure to the lowest achievable level above the PELs.

**Reference:** Go to another chapter, Respiratory hazards, chapter 296-841 WAC for additional information on employee exposure controls.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-40030, filed 8/23/05, effective 1/1/06.]

**WAC 296-855-40040 Respirators.****IMPORTANT:**

The requirements in this section are in addition to the requirements found in another chapter, Respirators, chapter 296-842 WAC.

Medical evaluations meeting all requirements of WAC 296-855-30030, will fulfill the medical evaluation requirement found in another chapter, Respirators, chapter 296-842 WAC.

**You must:**

- Provide respirators and require that employees use them in circumstances where exposure is above either PEL, such as when:

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- Feasible exposure controls are being put in place.
- You determine that exposure controls are not feasible.
- Feasible exposure controls do not reduce exposures to or below the PELs.
- Employees are responding to emergencies.
  - Ensure all respirator use is accompanied by eye protection either through the use of full-facepiece respirators, hoods, or chemical goggles.
  - Establish a respirator program that meets the requirements of another chapter, Respirators, chapter 296-842 WAC, and include the following additional requirement:
    - Limit selection of respirators to those with a full-facepiece or another type of respirator providing eye protection for EtO.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-40040, filed 8/23/05, effective 1/1/06.]

### WAC 296-855-500 Definitions.

#### Action level:

An airborne concentration of ethylene oxide (EtO) of 0.5 parts per million, calculated as an eight-hour time-weighted average.

#### Authorized personnel:

Individuals specifically permitted by the employer to enter the exposure control area to perform necessary duties, or to observe employee exposure evaluations.

#### Breathing zone:

The space around and in front of an employee's nose and mouth, forming a hemisphere with a six- to nine-inch radius.

#### CAS (Chemical Abstract Service) number:

CAS numbers are internationally recognized and used on material safety data sheets (MSDSs) and other documents to identify substances. For more information see <http://www.cas.org/about>.

#### Container:

Any container, except for pipes or piping systems that contains ethylene oxide. It can be any of the following:

- Barrel.
- Bottle.
- Can.
- Cylinder.
- Drum.
- Reaction vessel.
- Storage tank.

#### Day:

Any part of a calendar day.

#### Director:

The director means the director of the department of labor and industries or their designee.

#### Emergency:

Any event that could or does result in the unexpected significant release of ethylene oxide. Examples of emergencies include equipment failure, container rupture, or control equipment failure.

#### Ethylene oxide (EtO):

Is an organic chemical represented by the CAS registry number 75-21-8. EtO is a flammable colorless gas and is commonly used to sterilize medical equipment and as a fumigant for certain agricultural products. It is also used as an intermediary in the production of various chemicals such as ethylene glycol, automotive antifreeze, and polyurethane.

#### Exposure:

The contact an employee has with ethylene oxide, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

#### Licensed health care professional (LHCP):

An individual whose legally permitted scope of practice allows him or her to provide some or all of the health care services required for medical evaluations.

#### Permissible exposure limits (PELs):

PELs are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are specified in applicable WISHA rules. The PELs for ethylene oxide (EtO) are:

- Eight-hour time-weighted average (TWA<sub>8</sub>) of one part per million (ppm);

#### AND

- Fifteen-minute short-term exposure limit (STEL) of five ppm.

#### Short term exposure limit (STEL):

An exposure limit averaged over a short time period (usually fifteen minutes) that must not be exceeded during any part of an employee's workday.

#### Time-weighted average (TWA<sub>8</sub>):

An exposure limit averaged over an eight-hour period that must not be exceeded during an employee's workday.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-168, § 296-855-500, filed 8/23/05, effective 1/1/06.]

## Chapter 296-856 WAC FORMALDEHYDE

### WAC

296-856-100	Scope.
296-856-200	Basic rules.
296-856-20010	Preventive practices.
296-856-20020	Training.
296-856-20030	Personal protective equipment (PPE).
296-856-20040	Employee protective measures.
296-856-20050	Exposure evaluations.
296-856-20060	Notification.
296-856-20070	Exposure records.
296-856-300	Exposure and medical monitoring.
296-856-30010	Periodic exposure evaluations.
296-856-30020	Medical and emergency evaluations.
296-856-30030	Medical removal.
296-856-30040	Multiple LHCP review.
296-856-30050	Medical records.
296-856-400	Exposure control areas.
296-856-40010	Exposure controls.
296-856-40020	Establishing exposure control areas.
296-856-40030	Respirators.
296-856-500	Definitions.

**WAC 296-856-100 Scope.** This chapter applies to all occupational exposure to formaldehyde. Formaldehyde includes formaldehyde gas, its solutions, and materials that release formaldehyde.

#### Definitions:

**Formaldehyde** is an organic chemical with the formula of HCHO, represented by the chemical abstract service (CAS) registry number 50-00-0. Examples of primary uses of formaldehyde and its solutions are as follows:

- An intermediate in the production of:
  - Resins.

- Industrial chemicals.
- A bactericide or fungicide.
- A preservative.
- A component in the production of end-use consumer items such as cosmetics, shampoos, and glues.

**Exposure** is the contact an employee has with formaldehyde, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

Some of the requirements in this chapter may not apply to every workplace with an occupational exposure to formaldehyde. At a minimum, you need to:

- Follow requirements in the basic rules sections, WAC 296-856-20010 through 296-856-20070.
- Use employee exposure monitoring results required by Exposure evaluation, WAC 296-856-20060.
- Follow Table 1 to find out which additional sections of this chapter apply to your workplace.

**Table 1**  
**Sections That Apply To Your Workplace**

<b>If</b>	<b>Then continue to follow the basic rules, and the additional requirements in</b>
<ul style="list-style-type: none"> <li>• Employee exposure monitoring results are above the 8-hour time weighted average (TWA<sub>8</sub>) or short-term exposure limit (STEL)</li> </ul>	<ul style="list-style-type: none"> <li>• Exposure and medical monitoring, WAC 296-856-30010 through 296-856-30050;</li> <li><b>AND</b></li> <li>• Exposure control areas, WAC 296-856-40010 through 296-856-40030.</li> </ul>
<ul style="list-style-type: none"> <li>• Employee exposure monitoring results are:                             <ul style="list-style-type: none"> <li>- Below the TWA<sub>8</sub> and STEL;</li> <li><b>AND</b></li> <li>- Above the action level (AL)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Exposure and medical monitoring, WAC 296-856-30010 through 296-856-30050</li> </ul>
<ul style="list-style-type: none"> <li>• Employee exposure monitoring results are below the AL and STEL</li> </ul>	<ul style="list-style-type: none"> <li>• Exposure and medical monitoring, WAC 296-856-30020 through 296-856-30050</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-100, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-200 Basic rules.**

**Your responsibility:**

To measure and minimize employee exposure to formaldehyde.

**IMPORTANT:**

• The requirements in basic rules apply to all employers covered by the scope of this chapter. Additional sections may apply to you. Turn to the scope and follow Table 1 in that section to determine the additional sections of this chapter that apply to you.

**Section contents:**

- Preventive practices
- WAC 296-856-20010.

- Training
- WAC 296-856-20020.
- Personal protective equipment (PPE)
- WAC 296-856-20030.
- Employee protective measures
- WAC 296-856-20040.
- Exposure evaluations
- WAC 296-856-20050.
- Notification
- WAC 296-856-20060.
- Exposure records
- WAC 296-856-20070.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-200, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-20010 Preventive practices.**

**You must:**

• Make sure containers of gasses, solutions, or materials composed of greater than 0.1 percent formaldehyde, **and** capable of releasing formaldehyde at concentrations greater than 0.1 ppm to 0.5 ppm, are properly labeled, tagged, or marked with all of the following:

- That the product contains formaldehyde.
- The name and address of the responsible party (for example manufacturer, importer, or employer).

- A statement that the physical and health hazard information can be obtained from you, and from the material safety data sheet (MSDS).

• Label, tag, or mark containers and materials capable of releasing formaldehyde at levels above 0.5 ppm as follows:

- Include the words on the label "Potential Cancer Hazard."

- Follow the requirements for labels found in the following separate chapters:

■ The safety and health core rules, employer chemical hazard communications, WAC 296-800-170.

■ Material safety data sheet and label preparation, chapter 296-839 WAC.

**You must:**

• Make sure you have a housekeeping and maintenance program to detect leaks and spills by doing at least the following:

- Regular visual inspections.
- Preventive maintenance of equipment, that includes surveys for leaks, at regular intervals.

- In areas where spills could occur, make resources available to contain the spills, decontaminate the area affected, and dispose of waste.

- Promptly repair leaks and clean up spills.

- Train employees who will clean spills and repair leaks, about the methods for cleanup and decontamination.

- Make sure employees who will clean up spills and repair leaks, have the appropriate personal protective equipment and respirators.

- Dispose of waste from spills or leaks in sealed containers marked with information that states the contents contain formaldehyde and the hazards associated with formaldehyde exposure.

- Develop and implement appropriate procedures to minimize injury and loss of life if there is a possibility of an emergency, such as an uncontrolled release of formaldehyde.

**Note:** Following the requirements of a separate chapter, Emergency response, chapter 296-824 WAC, will meet the requirements for emergency procedures.

- Provide emergency washing facilities, for formaldehyde exposures, as required by a separate chapter, the safety and health core rules, First aid, WAC 296-800-150, as follows:

- Emergency showers in the immediate work areas where skin contact to solutions of 1 percent or greater of formaldehyde could occur.
- Emergency eye wash in the immediate work area where an eye contact to solutions of 0.1 percent or greater of formaldehyde could occur.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-20010, filed 4/4/06, effective 9/1/06.]

### WAC 296-856-20020 Training.

**Exemption:** Training is not required for employees when you have conclusive documentation that they cannot be exposed to formaldehyde at airborne concentrations above 0.1 parts per million (ppm).

#### You must:

- Provide training and information to employees exposed to formaldehyde at all of the following times:
  - At the time of initial assignment to a work area where there is formaldehyde exposure.
  - Whenever there is a new exposure to formaldehyde in their work area.
  - At least every twelve months after initial training.
- Make sure training includes at least the following:
  - The contents of this chapter and MSDS for formaldehyde.
  - The purpose of medical evaluations and a description of how you are fulfilling the medical evaluation requirements of this chapter.
  - The health hazards and signs and symptoms associated with formaldehyde exposure, including:
    - Cancer hazard.
    - Skin and respiratory system irritant and sensitizer.
    - Eye and throat irritation.
    - Acute toxicity.
  - How employees will immediately report any signs or symptoms suspected to be from formaldehyde exposure.
  - Descriptions of operations where formaldehyde is present.
  - Explanations of safe work practices to limit employee exposure to formaldehyde for each job.
  - The purpose, proper use, and limitations of personal protective clothing.
  - Instructions for the handling of spills, emergencies, and clean-up procedures.
  - An explanation of the importance of exposure controls, and instructions in the use of them.
  - A review of emergency procedures, including the specific duties or assignments of each employee in the event of an emergency.
  - The purpose, proper use, limitations, and other training requirements for respiratory protection, as required by a separate chapter, Respirators, chapter 296-842 WAC.
- Make sure any written training materials are readily available to your employees at no cost.

[Title 296 WAC—p. 3020]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-20020, filed 4/4/06, effective 9/1/06.]

### WAC 296-856-20030 Personal protective equipment (PPE).

#### You must:

- Provide PPE at no cost to employees and make sure employees wear the equipment.
- Make sure that employees do not take contaminated clothing or other PPE from the workplace.
  - Select PPE that is appropriate for your workplace based on at least the following:
    - The form of formaldehyde, such as gas, solution, or material.
    - The conditions of use.
    - The hazard to be prevented.
- Provide full body protection for entry into areas where formaldehyde exposure could exceed 100 parts per million (ppm) or when airborne concentrations are unknown.
- Protect employees from all contact with liquids containing one percent or more of formaldehyde by providing chemical protective clothing that is impervious to formaldehyde and other personal protective equipment, such as goggles and face shields, as appropriate for the operation.
- Make sure when face shields are worn, employees also wear chemical safety goggles if there could be eye contact with formaldehyde.
- Make sure contaminated clothing and other PPE is cleaned or laundered before it is used again.
- Repair or replace clothing and other PPE as needed to maintain effectiveness.
- Make sure storage areas for ventilating contaminated clothing and PPE are established to minimize employee exposure to formaldehyde.
  - Make sure storage areas and containers for contaminated clothing and PPE have labels or signs with the following warning:

**DANGER**  
**Formaldehyde-contaminated (clothing) or equipment**  
**Avoid inhalation and skin contact**

#### You must:

- Make sure that only employees trained to recognize the hazards of formaldehyde remove personal protective equipment (PPE) and clothing from storage areas for the purposes of disposal, cleaning, or laundering.
- Inform any person who launders, cleans, or repairs contaminated clothing or other PPE, of the hazards of formaldehyde and procedures to safely handle the clothing and equipment.
- Provide change rooms for employees who are required to change from work clothes into protective clothing to protect them from skin contact with formaldehyde.
  - Make sure change rooms have separate storage facilities for street clothes and protective clothing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-20030, filed 4/4/06, effective 9/1/06.]

(2007 Ed.)

**WAC 296-856-20040 Employee protective measures.****You must:**

- Implement appropriate protective measures while you conduct your exposure evaluation.
  - Employees performing activities with exposure to airborne formaldehyde that could exceed the 0.75 ppm, 8-hour time weighted average (TWA<sub>8</sub>), or the 2 ppm 15-minute short-term exposure limit (STEL), need to follow the requirements in WAC 296-856-30010 through 296-856-40030 of this chapter.

**Reference:** For respirator requirements, turn to Respirators, WAC 296-856-40060.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-20040, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-20050 Exposure evaluations.****IMPORTANT:**

- This section applies when there is a potential for an employee to be exposed to airborne formaldehyde in your workplace.
  - When you conduct an exposure evaluation in a workplace where an employee uses a respirator, the protection provided by the respirator is not considered.
  - Following this section will fulfill the requirements to identify and evaluate respiratory hazards found in a separate chapter, Respiratory hazards, chapter 296-841 WAC.

**You must:**

- Conduct an employee exposure evaluation to accurately determine airborne concentrations of formaldehyde by completing Steps 1 through 7 of the exposure evaluation process, each time any of the following apply:
  - No evaluation has been conducted.
  - Changes have occurred in any of the following areas that may result in new or increased employee exposures:
    - Production.
    - Processes.
    - Exposure controls, such as ventilation systems or work practices.
    - Personnel.
    - Equipment.
  - You have any reason to suspect new or increased employee exposure may occur.
  - You receive a report of employee developing signs and symptoms associated with formaldehyde exposure.

**You must:**

- Provide affected employees or their designated representatives an opportunity to observe exposure monitoring required by this chapter.
- Make sure observers entering areas with formaldehyde exposure:
  - Are provided with and use the same protective clothing, respirators, and other personal protective equipment (PPE) that employees working in the area are required to use;

**AND**

- Follow any safety and health requirements that apply.

**Exposure evaluation process:**

- Exemption:** • Exposure monitoring is not necessary if you have documentation conclusively demonstrating that employee exposure for a particular material and the operation where it is used, cannot exceed the action level (AL) or short-term exposure limit (STEL) during any conditions reasonably anticipated.

- Such documentation can be based on observations, data, calculations, and previous air monitoring results. Previous air monitoring results:
  - Must meet the accuracy required by Step 5.
  - Must be based on data that represents conditions being evaluated in your workplace.
  - May be from outside sources, such as industry or labor studies.

**Step 1:** Identify all employees who have potential exposure to airborne formaldehyde in your workplace.

**Step 2:** Identify operations where employee exposures could exceed the 15-minute short-term exposure limit (STEL) for formaldehyde of 2 parts per million (ppm).

**Note:** You may use monitoring devices such as colorimetric indicator tubes or real-time monitors to screen for activities where employee exposures could exceed the STEL.

**Step 3:** Select employees from those working in the operations you identified in Step 2 who will have their 15-minute exposures monitored.

**Step 4:** Select employees from those identified in Step 1 who will have their 8-hour exposures monitored.

- Make sure the exposures of the employees selected represent 8-hour exposures for all employees identified in Step 1, including each job activity, work area, and shift.

- If you expect exposures to be **below** the action level (AL), you may limit your selection to those employees reasonably believed to have the highest exposures.

- If you find any of those employees' exposure to be **above** the AL, then you need to repeat monitoring to include each job activity, work area, and shift.

**Reference:** A written description of the procedure used for obtaining representative employee exposure monitoring results needs to be kept as part of your exposure records, as required by Exposure records, WAC 296-856-20070.

- This description can be created while completing Steps 3 through 6 of this exposure evaluation process.

**Step 5:** Determine how you will obtain accurate employee exposure monitoring results. Select and use an air monitoring method with a confidence level of 95 percent, that is accurate to:

- ±25 percent when concentrations are potentially above the TWA of 0.75 parts per million (ppm).

- ±25 percent when concentrations are potentially above the STEL of 2 ppm.

- ±35 percent when concentrations are potentially above the AL.

**Note:** • Here are examples of air monitoring methods that meet this accuracy requirement:
 

- OSHA Method 52 found at <http://www.osha.gov/dts/sltc/methods/toc.html>.
- NIOSH methods: 2016, 2514, 3500, 2539, and 5700, found at <http://www.cdc.gov/niosh/homepage.html> and linking to the NIOSH Manual of Analytical Methods.
- Direct reading methods found at <http://www.osha.gov/SLTC/formaldehyde/index.html>

**Step 6:** Obtain employee exposure monitoring results by collecting air samples to accurately determine the formaldehyde exposure of employees identified in Steps 3 and 4.

- Make sure samples are collected from each selected employee's breathing zone.

**Note:** • You may use any sampling method that meets the accuracy specified in Step 5. Examples of these methods include:
 

- Real-time monitors that provide immediate exposure monitoring results.
- Equipment that collects samples that are sent to a laboratory for analysis.

- The following are examples of methods for collecting samples representative of 8-hour exposures.
  - Collect one or more continuous samples, such as a single 8-hour sample or four 2-hour samples.
  - Take a minimum of 5 brief samples, such as five 15-minute samples, during the work shift at randomly selected times.
- For work shifts longer than 8 hours, monitor the continuous 8-hour portion of the shift expected to have the highest average exposure concentration.

**Step 7:** Have the samples you collected analyzed to obtain employee exposure monitoring results for 8-hour and short-term exposure limits (STEL) exposures.

– Determine if employee exposure monitoring results are above or below the following values:

- 8-hour action level (AL) of 0.5 ppm.
- 8-hour time-weighted average (TWA<sub>8</sub>) of 0.75 ppm.
- 15-minute short-term exposure limit (STEL) of 2 ppm.

**Reference:** To use the monitoring results to determine which additional chapter sections apply to employee exposure in your workplace, turn to the Scope, WAC 296-856-100, and follow Table 1 in that section.

- Note:**
- You may contact your local WISHA consultant for help with:
    - Interpreting data or other information.
    - Determining 8-hour employee exposure monitoring results.
  - To contact a WISHA consultant:
    - Go to the safety and health core rules, chapter 296-800 WAC;
- AND**
- Find the resources section, and under "other resources," find service locations for labor and industries.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-20050, filed 4/4/06, effective 9/1/06.]

#### **WAC 296-856-20060 Notification.**

##### **You must:**

- Provide written notification of exposure monitoring results to employees represented by your exposure evaluation, within five business days after the results become known to you.

– In addition, when employee exposure monitoring results are above the permissible exposure limits (PEL), of either the 8-hour time weighted average (TWA<sub>8</sub>) or the 15-minute short-term exposure limit (STEL), provide written notification of both of the following within fifteen business days after the results become known to you:

- Corrective actions being taken and a schedule for completion.
- Any reason why exposures cannot be lowered to below the PEL.

- Note:**
- You can notify employees either individually or post the notifications in areas readily accessible to affected employees.
  - Posted notification may need specific information that allows affected employees to determine which monitoring results apply to them.
  - Notification may be:
    - In any written form, such as handwritten or e-mail.
    - Limited to the required information, such as exposure monitoring results.
  - When notifying employees about corrective actions, your notification may refer them to a separate document that is available and provides the required information.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-20060, filed 4/4/06, effective 9/1/06.]

#### **WAC 296-856-20070 Exposure records.**

##### **You must:**

- Establish and keep complete and accurate records for all exposure monitoring conducted under this chapter. Make sure the record includes at least the following:

– The name, unique identifier, and job classification of both:

- The employee sampled;

**AND**

- All other employees represented by the sampled employee.

– An estimate of the exposure for each employee "represented" by this monitoring.

– A description of the methods used to obtain exposure monitoring results and evidence of the method's accuracy.

– Any environmental conditions that could affect exposure concentration measurements.

– A description of the procedure used to obtain representative employee exposure monitoring results.

– The operation being monitored.

– The date, number, duration, location, and the result of each sample taken.

– The type of protective devices worn.

- Maintain documentation that conclusively demonstrates that employee exposure for formaldehyde and the operation where it is used cannot exceed the action level or the 15-minute short-term exposure limit, during any reasonable anticipated conditions.

– Such documentation can be based on observations, data, calculation, and previous air monitoring results.

- Keep exposure monitoring records for at least thirty years.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-20070, filed 4/4/06, effective 9/1/06.]

#### **WAC 296-856-300 Exposure and medical monitoring.**

##### **Your responsibility:**

To monitor employee health and workplace exposures to formaldehyde.

##### **Section contents:**

Periodic exposure evaluations

WAC 296-856-30010.

Medical and emergency evaluations

WAC 296-856-30020.

Medical removal

WAC 296-856-30030.

Multiple LHCP review

WAC 296-856-30040.

Medical records

WAC 296-856-30050.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-300, filed 4/4/06, effective 9/1/06.]

#### **WAC 296-856-30010 Periodic exposure evaluations.**

**Exemption:** Periodic employee exposure monitoring is not required if exposure monitoring results conducted to fulfill requirements in this chapter, Exposure evaluations, WAC 296-856-20050, are below both the action level (AL) and 15-minute short-term exposure limit (STEL).

**You must:**

- Obtain employee exposure monitoring results as specified in Table 2 by repeating Steps 1 and 7 of the exposure evaluation process found within this chapter, in Exposure evaluations, WAC 296-856-20050.

**Note:** If you document that one work shift consistently has higher exposure monitoring results than another for a particular operation, then you may limit sample collection to the work shift with higher exposures and use those results to represent all employees performing the operation on other shifts.

**Table 2**  
**Periodic Exposure Evaluation Frequencies**

<b>If employee exposure monitoring results</b>	<b>Then</b>
Are above the action level (AL) of 0.5 ppm	Conduct additional exposure monitoring at least every six months for the employees represented by the monitoring results
Are above the short-term exposure limit (STEL) of 2 ppm	Repeat exposure monitoring at least once a year, or more often as necessary to evaluate employee exposure
Have decreased to below the AL <b>and</b> the STEL	You may <b>stop</b> periodic employee exposure monitoring for employees represented by the monitoring results.  Note: You need to monitor again if there is a change in any of the following that may result in new or increased employee exposures:
<b>AND</b>	
The decrease is demonstrated by two consecutive exposure evaluations made at least seven days apart	<ul style="list-style-type: none"> <li>• Production</li> <li>• Processes</li> <li>• Exposure controls, such as ventilation systems or work practices</li> <li>• Personnel</li> <li>• Equipment</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-30010, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-30020 Medical and emergency evaluations.**

**IMPORTANT:**

- Medical evaluations completed to meet the respirator use requirements of this section also need to meet the requirements found in a separate chapter, Respirators, medical evaluations, WAC 296-842-140.

**You must:**

- Make medical evaluations available to current employees who:
  - Are exposed to formaldehyde concentrations above the action level (AL) or short-term exposure limit (STEL).
  - Are exposed to formaldehyde during an emergency situation.
  - Develops signs and symptoms commonly associated with formaldehyde exposure.

- Make medical examinations available to current employees as deemed necessary by the LHCP after reviewing the medical disease questionnaire for employees that are presently not required to wear a respirator.

- Complete Steps 1 through 4 of the medical evaluation process at the following times:

- Initially, when employees are assigned to work in an area where exposure monitoring results are above the action level (AL) or above the STEL.

- At least every twelve months from the initial medical evaluation for employees exposed to formaldehyde above the action level (AL) or the STEL.

- Whenever the employee develops signs and symptoms commonly associated with formaldehyde.

**Note:** Signs and symptoms are rarely associated with formaldehyde concentrations in air less than 0.1 parts per million (ppm), and in materials at concentration levels less than 0.1 percent.

**You must:**

- Make medical evaluations available:
  - At no cost to employees, including travel costs and wages associated with any time spent obtaining the medical evaluation.
  - At reasonable times and places.

**Note:** • Employees who decline to receive a medical evaluation to monitor for health effects caused by formaldehyde are not excluded from receiving a separate medical evaluation for respirator use.

• If employers discourage participation in medical monitoring for health effects caused by formaldehyde, or in any way interferes with an employee's decision to continue with this program, this interference may represent unlawful discrimination under RCW 49.17.160, Discrimination against employee filing complaint, instituting proceedings, or testifying prohibited—Procedure—Remedy.

**Medical evaluation process:**

**Step 1:** Select a licensed healthcare professional (LHCP) who will conduct or supervise examinations and procedures.

- If the LHCP is not a licensed physician, make sure individuals who conduct pulmonary function tests, have completed a training course in spirometry, sponsored by an appropriate governmental, academic, or professional institution.

**Note:** The LHCP must be a licensed physician or supervised by a physician.

**Step 2:** Make sure the LHCP receives all of the following information before the medical evaluation is performed:

- A copy of this chapter.

- The helpful tools: *Substance Technical Guideline for Formalin, Medical Surveillance, and Medical Disease Questionnaire*.

- A description of the duties of the employee being evaluated and how these duties relate to formaldehyde exposure.

- The anticipated or representative exposure monitoring results for the employee being evaluated.

- A description of the personal protective equipment (PPE) and respiratory protection each employee being evaluated uses or will use.

- Information in your possession from previous employment-related examinations when this information is not available to the examining LHCP.

– A description of the emergency and the exposure, when an examination is provided due to an exposure received during an emergency.

– Instructions that the written opinions the LHCP provides to you, does **not** include any diagnosis or other personal medical information, **and** is limited to the following information:

- The LHCP's opinion about whether or not medical conditions were found that would increase the employee's risk for impairment from exposure to formaldehyde.

- Any recommended limitations for formaldehyde exposure and use of respirators or other PPE.

- A statement that the employee has been informed of medical results and medical conditions caused by formaldehyde exposure requiring further examination or treatment.

**Step 3:** Make a medical evaluation available to the employee. Make sure it includes the content listed in Table 3, Content of Medical Evaluations.

**Step 4:** Obtain the LHCP's written opinion for the employee's medical evaluation and make sure the employee receives a copy within five business days after you receive the written opinion.

– Make sure the written opinion is limited to the information specified for written opinions in Step 2.

**Note:** If the written opinion contains specific findings or diagnoses unrelated to occupational exposure, send it back and obtain a revised version without the additional information.

**Table 3**  
**Content of Medical Evaluations**

When conducting an	Include
Initial	<ul style="list-style-type: none"> <li>• A medical disease questionnaire that provides a work and medical history with emphasis on:</li> </ul>
<b>OR</b>	
Annual evaluation	<ul style="list-style-type: none"> <li>– Upper or lower respiratory problems</li> <li>– Allergic skin conditions or dermatitis</li> <li>– Hyper reactive airway diseases</li> <li>– Eyes, nose, and throat irritation</li> <li>• Physical examinations deemed necessary by the LHCP, that include at a minimum:                             <ul style="list-style-type: none"> <li>– Examinations with emphasis on evidence of irritation or sensitization of skin, eyes, and respiratory systems, and shortness of breath</li> <li>– Counseling, provided by the LHCP to the employee as part of the medical examination if the LHCP determines that the employee has a medical condition that may be aggravated by formaldehyde exposure</li> </ul> </li> <li>• Pulmonary function tests for respirator users, that include at a minimum:                             <ul style="list-style-type: none"> <li>– Forced vital capacity (FVC)</li> </ul> </li> </ul>

When conducting an	Include
	<ul style="list-style-type: none"> <li>– Forced expiratory volume in one second (FEV1)</li> <li>– Forced expiratory flow (FEF)</li> </ul>
Emergency exposure evaluation	<ul style="list-style-type: none"> <li>• A medical examination that includes a work history with emphasis on evidence of upper or lower respiratory problems, allergic conditions, skin reaction or hypersensitivity, and any evidence of eye, nose, or throat irritation</li> <li>• Additional examinations the licensed healthcare professional (LHCP) believes appropriate, based on the employee's exposure to formaldehyde</li> </ul>
Evaluation of reported signs and symptoms	<ul style="list-style-type: none"> <li>• A medical disease questionnaire that provides a work and medical history with emphasis on:                             <ul style="list-style-type: none"> <li>– Upper or lower respiratory problems</li> <li>– Allergic skin conditions or dermatitis</li> <li>– Hyper reactive airway diseases</li> <li>– Eyes, nose, and throat irritation</li> </ul> </li> <li>• A physical examination if considered necessary by the LHCP that includes at a minimum:                             <ul style="list-style-type: none"> <li>– Examinations with emphasis on evidence of irritation or sensitization of skin, eyes, respiratory systems, and shortness of breath</li> <li>– Counseling if the LHCP determines that the employee has a medical condition that may be aggravated or caused by formaldehyde exposure</li> </ul> </li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-30020, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-30030 Medical removal.**

**Exemption:** Medical removal or restrictions do not apply when skin irritation or skin sensitization occurs from products that contain less than 0.05 percent of formaldehyde.

**IMPORTANT:**

- This section applies when an employee reports irritation of the mucosa of the eye or the upper airways, respiratory sensitization, dermal irritation, or skin sensitization from formaldehyde exposure.

- When determining the content of formaldehyde in materials that employees have exposure to, you may use documentation, such as manufacturer's data, or independent laboratory analyses.

**You must:**

- Complete Steps 1 through 4 of the medical evaluation process for removal of employees, in this section, for employees that report signs and symptoms of formaldehyde exposure.

**Note:** When the employee is exposed to products containing less than 0.1 percent formaldehyde, the LHCP can assume, absent of contrary evidence, that employee signs and symptoms are not due to formaldehyde exposure.

**Medical evaluation process for removal of employees:**

**Step 1:** Provide the employee with a medical evaluation by an LHCP selected by the employer.

**Step 2:** Based on information in the medical questionnaire the LHCP will determine if the employee will receive an examination as described in Table 3, Content of Medical Evaluations, in Medical and emergency evaluations, WAC 296-856-30020.

– If the LHCP determines that a medical examination is not necessary, there will be a two-week evaluation and correction period to determine whether the employee's signs and symptoms resolve without treatment, from the use of creams, gloves, first-aid treatment, personal protective equipment, or industrial hygiene measures that reduce exposure.

■ If before the end of the two-week period the employee's signs or symptoms worsen, immediately refer them back to the LHCP.

■ If signs and symptoms persist after the two-week period, the LHCP will administer a physical examination as outlined in Table 3, Content of Medical Evaluations, in Medical and emergency evaluations, WAC 296-856-30020.

**Step 3:** Promptly follow the LHCP's restrictions or recommendations. If the LHCP recommends removal from exposure, do either of the following:

– Transfer the employee to a job currently available that:

■ The employee qualifies for, or could be trained for, in a short period of time (up to six months);

**AND**

■ Will keep the employee's exposure to as low as possible, and never above the AL of 0.5 parts per million.

– Remove the employee from the workplace until either:

■ A job becomes available that the employee qualifies for, or could be trained for in a short period of time **and** will keep the employee's exposure to as low as possible and never above the AL;

**OR**

■ The employee is returned to work or permanently removed from formaldehyde exposure, as determined by completing Steps 1 through 3 of the medical evaluation process for removal of employees, in this section.

**Step 4:** Make sure the employee receives a follow-up examination within six months from being removed from the formaldehyde exposure by the LHCP. At this time, the LHCP will determine if the employee can return to their original job status, or if the removal is permanent.

**You must:**

• Maintain the employee's current pay rate, seniority, and other benefits if:

– You move them to a job that they qualify for, or could be trained in a short period of time, and will keep the employee's exposure to as low as possible and never above the AL;

**OR**

– In the case there is no such job available, then until they are able to return to their original job status or after six months, whichever comes first.

(2007 Ed.)

**Note:**

- If you must provide medical removal benefits and the employee will receive compensation for lost pay from other sources, you may reduce your medical removal benefit obligation to offset the amount provided by these sources.
- Examples of other sources are:
  - Public or employer-funded compensation programs.
  - Employment by another employer, made possible by the employee's removal.

• Make medical evaluations available:

– At no cost to employees, including travel costs and wages associated with any time spent obtaining the medical examinations and evaluations.

– At reasonable times and places.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-30030, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-30040 Multiple LHCP review.**

**IMPORTANT:**

• This section applies each time a medical examination or consultation is performed to determine whether medical removal or restriction is required.

**You must:**

• Promptly notify employees that they may seek a second medical opinion from an LHCP of their choice, each time a medical examination or consultation is conducted by an LHCP selected by the employer to evaluate medical removal.

– At a minimum, this notification must include the details of your multiple physician review process.

**Note:** Notification may be provided in writing or by verbal communication.

**You must:**

• Complete requirements in the multiple LHCP review process once you have been informed of an employee's decision to seek a second medical opinion.

• Pay for and complete the multiple LHCP review process for employees who:

– Inform you in writing or by verbal communication that they will seek a second medical opinion.

– Initiate steps to make an appointment with the LHCP they select. This LHCP will be referred to as the second LHCP.

– Fulfill the previous actions to inform you, and initiate steps for an appointment, within fifteen days from receiving either your notification or the initial LHCP's written opinion, whichever is received later.

**Note:** This process allows for selection of a second LHCP and, when disagreements between LHCPs persist, for selection of a third LHCP.

**Multiple LHCP review process:**

**Step 1:** Make sure the information required by Step 4 of the medical evaluation process is received by the second LHCP. This process is located in the section, Medical and emergency evaluations, WAC 296-856-30020.

– This requirement also applies when a third LHCP is selected.

**Step 2:** Allow the second LHCP to:

– Review findings, determinations, or recommendations from the original LHCP you selected;

**AND**

– Conduct medical examinations, consultations, and laboratory tests as necessary to complete their review.

**Step 3:** Obtain a written opinion from the second LHCP and make sure the employee receives a copy within five busi-

ness days from the date you receive it. If findings, determinations, and recommendations in the written opinion are:

– Consistent with the written opinion from the initial LHCP, you can end the multiple physician review process. Make sure you follow the LHCP's recommendations.

– Inconsistent with the written opinion from the initial LHCP, then you and the employee must make sure efforts are made for the LHCPs to resolve any disagreements.

■ If the LHCPs quickly resolve disagreements, you can end the multiple physician review process. Make sure you follow the LHCP's recommendations.

■ If disagreements are not resolved within thirty business days, continue to Step 4.

**Step 4:** You and the employee must work through your respective LHCPs to agree on the selection of a third LHCP, or work together to designate a third LHCP to:

– Review findings, determinations, or recommendations from the initial and second LHCP;

AND

– Conduct medical examinations, consultations, and laboratory tests as necessary to resolve disagreements between the initial and second LHCP.

**Step 5:** Obtain a written opinion from the third LHCP and make sure the employee receives a copy within five business days from the day you receive it.

– Follow the third LHCP's recommendations, unless you and the employee agree to follow recommendations consistent with at least one of the three LHCPs.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-30040, filed 4/4/06, effective 9/1/06.]

#### WAC 296-856-30050 Medical records.

##### IMPORTANT:

• This section applies when a medical evaluation is performed or any time a medical record is created for an employee exposed to formaldehyde.

##### You must:

• Establish and maintain complete and accurate medical records for each employee receiving a medical evaluation for formaldehyde and make sure the records include all the following:

– The employee's name and unique identifier.

– A description of any health complaints that may be related to formaldehyde exposure.

– A copy of the licensed healthcare professional's (LHCP's) written opinions.

– Exam results.

– Medical questionnaires.

• Maintain medical records for the duration of employment plus thirty years.

**Note:**

- Employee medical records need to be maintained in a confidential manner. The medical provider may keep these records for you.
- Medical records may only be accessed with the employee's written consent.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-30050, filed 4/4/06, effective 9/1/06.]

#### WAC 296-856-400 Exposure control areas.

##### Your responsibility:

To control employee exposure to airborne formaldehyde and protect employees by using appropriate respirators.

[Title 296 WAC—p. 3026]

##### IMPORTANT:

• These sections apply when employee exposure monitoring results are above the permissible exposure limit (PEL):

- The 8-hour time-weighted average (TWA<sub>8</sub>) of 0.75 parts per million (ppm);

##### OR

- The 15-minute short-term exposure limit (STEL) of two parts per million (ppm).

##### Section contents:

Exposure controls

WAC 296-856-40010.

Establishing exposure control areas

WAC 296-856-40020.

Respirators

WAC 296-856-40030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-400, filed 4/4/06, effective 9/1/06.]

#### WAC 296-856-40010 Exposure controls.

##### IMPORTANT:

• Respirators and other personal protective equipment (PPE) are **not** exposure controls.

##### You must:

• Use feasible exposure controls to reduce employee exposures to a level below the permissible exposure limit (PEL) or to as low a level as achievable.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-40010, filed 4/4/06, effective 9/1/06.]

#### WAC 296-856-40020 Establishing exposure control areas.

##### You must:

• Establish temporary or permanent exposure control areas where airborne concentrations of formaldehyde are above either the 8-hour time weighted average (TWA<sub>8</sub>) or the 15-minute short-term exposure limit (STEL), by doing at least the following:

– Clearly identify the boundaries of exposure control areas in any way that minimizes employee access.

– Post signs at access points to exposure control areas that:

■ Are easy to read (for example, they are kept clean and well lit);

AND

■ Include this warning:

**DANGER**  
**Formaldehyde**  
**Irritant and Potential Cancer Hazard**  
**Authorized Personnel Only**

**Note:** This requirement does not prevent you from posting other signs.

##### You must:

• Allow only employees, who have been trained to recognize the hazards of formaldehyde exposure, to enter exposure control areas.

**Note:**

- When identifying the boundaries of exposure control areas you should consider factors such as:
  - The level and duration of airborne exposure.
  - Whether the area is permanent or temporary.
  - The number of employees in adjacent areas.

(2007 Ed.)

- You may use permanent or temporary enclosures, caution tape, ropes, painted lines on surfaces, or other materials to visibly distinguish exposure control areas or separate them from the rest of the workplace.

**You must:**

- Inform other employers at multi-employer work sites of the exposure control areas, and the restrictions that apply to those areas.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-40020, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-40030 Respirators.****IMPORTANT:**

- The requirements in this section are in addition to the requirements found in the following separate chapters:
  - Respiratory hazards, chapter 296-841 WAC.
  - Respirators, chapter 296-842 WAC.
- Medical evaluations meeting all requirements of Medical and emergency evaluations, WAC 296-856-30020, will fulfill the medical evaluations requirements found in Respirators, chapter 296-842 WAC, a separate chapter.

**You must:**

- Develop a written respirator program as required by a separate chapter, Respirators, chapter 296-842 WAC, and include the following additional requirements:
    - Require that employees use respirators in any of the following circumstances:
      - Employees are in an exposure control area.
      - Feasible exposure controls are being put in place.
      - Where you determine that exposure controls are not feasible.
      - Feasible exposure controls do not reduce exposures to, or below, the PEL.
      - Employees are performing tasks presumed to have exposures above the PEL.
      - Emergencies.
    - Make sure all respirator use is accompanied by eye protection either through the use of full-facepiece respirators, hoods, or chemical goggles.
      - Provide employees with powered air-purifying respirators (PAPRs) when this type of respirator will provide appropriate protection **and** any of the following applies:
        - A licensed healthcare professional (LHCP) allows this type of respirator in their written opinion.
        - The employee has difficulty using a negative pressure respirator.
        - The employee chooses to use this type of respirator.
      - Make sure you replace the air-purifying chemical cartridge or canister as follows:
        - At the beginning of each work shift;
- AND**
- As required by Respirators, chapter 296-842 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-40030, filed 4/4/06, effective 9/1/06.]

**WAC 296-856-500 Definitions.****Action level**

An airborne concentration of formaldehyde of 0.5 parts per million of air calculated as an 8-hour time-weighted average.

(2007 Ed.)

**Authorized personnel**

Individuals specifically permitted by the employer to enter the exposure control area to perform duties, or to observe employee exposure evaluations as a designated representative.

**Breathing zone**

The space around and in front of an employee's nose and mouth, forming a hemisphere with a six- to nine-inch radius.

**CAS (chemical abstract service) number**

CAS numbers are internationally recognized and used on material safety data sheets (MSDSs) and other documents to identify substances. For more information see <http://www.cas.org>

**Canister or cartridge (air-purifying)**

Part of an air-purifying respirator that consists of a container holding materials such as fiber, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

**Container**

Any container, except for pipes or piping systems that contains formaldehyde. It can be any of the following:

- Barrel.
- Bottle.
- Can.
- Cylinder.
- Drum.
- Reaction vessel.
- Shipping containers.
- Storage tank.

**Designated representative**

Any one of the following:

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written employee authorization.
- The legal representative of a deceased or legally incapacitated employee.

**Emergency**

Any event that could or does result in the unexpected significant release of formaldehyde. Examples of emergencies include equipment failure, container rupture, or control equipment failure.

**Exposure**

The contact an employee has with formaldehyde, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

**Formaldehyde**

An organic chemical with the formula of HCHO, represented by the chemical abstract service (CAS) registry number 50-00-0. Examples of primary uses of formaldehyde and its solutions are as follows:

- An intermediate in the production of:
  - Resins.
  - Industrial chemicals.
- A bactericide or fungicide.
- A preservative.
- A component in the manufacture of end-use consumer items such as cosmetics, shampoos, and glues.

[Title 296 WAC—p. 3027]

**Licensed healthcare professional (LHCP)**

An individual whose legally permitted scope of practice allows him or her to provide some or all of the healthcare services required for medical evaluations.

**Permissible exposure limits (PELs)**

PELs are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are also specified in WISHA rules found in other chapters. The PEL for formaldehyde is an 8-hour time-weighted average (TWA<sub>8</sub>) of 0.75 parts per million (ppm) and a 15-minute short-term exposure limit of 2 ppm.

**Short-term exposure limit (STEL)**

An exposure limit averaged over a 15-minute period that must not be exceeded during an employee's workday.

**Time-weighted average (TWA<sub>8</sub>)**

An exposure limit averaged over an 8-hour period that must not be exceeded during an employee's workday.

**Uncontrolled release**

A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be uncontrolled releases.

Examples of conditions that could create a significant safety and health risk are:

- Large-quantity releases.
- Small releases that could be highly toxic.
- Potentially contaminated individuals arriving at hospitals.
- Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-08-087, § 296-856-500, filed 4/4/06, effective 9/1/06.]

**Chapter 296-860 WAC****RAILROAD CLEARANCES AND WALKWAYS IN PRIVATE RAIL YARDS AND PLANTS**

(Formerly chapter 296-28 WAC)

**WAC**

296-860-100	Scope.
296-860-200	Maintain safe clearances and walkways.
296-860-20010	Post warning signs and train employees about clearances approved before April 3, 1961.
296-860-20020	Construct and maintain rail yard walkways for employee safety.
296-860-20030	Install radiation detectors according to manufacturer's specifications.
296-860-20040	Maintain overhead clearances.
296-860-20050	Maintain side clearances.
296-860-20060	Maintain clearances between tracks.
296-860-20070	Move excessive height or width rail car loads with care.
296-860-20080	Follow these requirements to conduct narrow gauge rail operations.
296-860-300	Definitions.

**WAC 296-860-100 Scope.****IMPORTANT:**

This chapter applies to all railroad clearances and walkways in rail yards and plants including logging railroad yards such as mill yards, maintenance yards and sorting yards.

[Title 296 WAC—p. 3028]

If you are uncertain about which WISHA requirements to follow, you must comply with those that best protect employees' safety and health. Contact your local L&I office if you need assistance in making this decision.

**Exemptions:**

• These exemptions apply to chapter 296-860 WAC, Railroad clearances and walkways in private rail yards and plants, and do not require a department variance:

– You may move the following equipment, using less than the minimum standard clearances, if the situation is unavoidable and you have taken all reasonable steps to protect your employees:

■ Track construction or maintenance materials

■ Special work equipment used for railroad construction, maintenance or operations

■ Any railroad equipment during emergencies.

– You may have overhead or side clearances less than the minimum standard clearances required in this chapter if they were legally created before April 3, 1961.

**Note:** If a building, structure, or facility constructed before April 3, 1961, is relocated or reconstructed, the clearance requirements in this chapter apply unless the department grants a variance.

– Tracks built before April 3, 1961:

■ May be extended according to the legal track clearance requirements in effect when they were originally constructed

■ Are exempt from the track clearance requirements in WAC 296-860-10050, Table 5.

– Chapter 296-54 WAC, Safety standards—Logging operations, regulates all logging railroads or any rail operations related to logging, except for yard clearances.

**Other rules that may apply to your workplace**

The *WISHA Safety & Health Core Rules* book, chapter 296-800 WAC, contains the basic requirements that apply to employers in Washington. It also contains:

• An introduction that lists important information you should know, including a section on building, fire and electrical codes

• A resource section that includes a complete list of all WISHA rules

Other WISHA rules may apply to you, depending upon the activities and operations of your workplace. Contact your local L&I office if you are uncertain about which WISHA requirements pertain to you.

• To access the *Safety & Health Core Rules* book online: <http://www.lni.wa.gov/wisha/corerules/default.htm>

• For a CD or paper copy contact us:

Labor and Industries

P.O. Box 44620

Olympia, WA 98504-4620

Telephone: 1-800-4be-safe (1-800-423-7233)

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-100, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-200 Maintain safe clearances and walkways.****SUMMARY****Your responsibility:**

To prevent injuries and fatalities to employees by maintaining safe railroad clearances and walkways in your rail yards and plants.

(2007 Ed.)

**You must:**

Post warning signs and train employees about clearances approved before April 3, 1961

WAC 296-860-20010

Construct and maintain rail yard walkways for employee safety

WAC 296-860-20020

Install radiation detectors according to manufacturer's specifications

WAC 296-860-20030

Maintain overhead clearances

WAC 296-860-20040

Maintain side clearances

WAC 296-860-20050

Maintain clearances between tracks

WAC 296-860-20060

Move excessive height and/or width rail car loads with care

WAC 296-860-20070

Conduct narrow gauge rail operations according to the requirements of this section

WAC 296-860-20080.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-200, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20010 Post warning signs and train employees about clearances approved before April 3, 1961.**

**You must:**

(1) Post warning signs near tracks with clearances approved before April 3, 1961, so employees are aware of the minimal clearances and their potential hazards. The signs must:

- Be highly visible
- Be easy to read
- Alert employees to the danger of railway equipment operating on your yard and plant tracks.

(2) Include in your employee safety and health training information about:

- Any minimal clearances and their location
- Potential hazards associated with them
- The location of any clearance warning signs.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20010, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20020 Construct and maintain rail yard walkways for employee safety.**

**Important:**

- You have two years from October 01, 2002, (the effective date of this rule), to comply with the construction requirements of this section, unless the department determines during an inspection that your walkways create a serious safety hazard.

- If you are not sure a serious safety hazard exists in your workplace, you can request a free consultation from the department by calling your local L&I office.

**Construction of walkways****You must:**

- Build walkways in rail yard areas where employees regularly work on the ground.

(2007 Ed.)

- Construct rail yard walkways that can be maintained in a safe condition:

- With reasonably smooth walking surfaces
- That will not interfere with track drainage.

- Use any of the following materials when constructing your walkway:

- Crushed material that does not exceed 1 1/2 inches in size. For this rule, "1 1/2 inches in size" means one of the following (percentages refer to weight measurement and sieve size standard in the industry):

Percentage of material passing through a sieve opening	Sieve opening size
100	1 1/2 inch square
90 - 100	1 inch square
40 - 80	3/4 inch square
15 - 60	1/2 inch square
0 - 30	3/8 inch square
0 - 10	#4
0 - 5	#8
0 - 0.5	#200

Smaller crushed material is preferred and should be used where drainage and durability is not an issue. Crushed material that is 3/4 inch or less in size is recommended for switching leads in yards.

- Asphalt, concrete, planking, grating, or other similar material.

- Natural materials such as gravel or dirt.

**You must:**

- Construct walkways wide enough for employees to safely perform their duties

- Construct walkways with a grade or slope in any direction with not more than one inch of elevation for each eight inches of horizontal length, unless it is geographically impractical.

**Maintenance of walkways****You must:**

- Keep all walkways clear of vegetation, debris, mud, or other obstructions that create a potential hazard for employees.

- Remove all standing water from all walkways as soon as reasonably possible.

- Reopen walkways temporarily closed for a construction project within thirty days after the project is completed.

**You must:**

- Repair walkways that have been damaged and temporarily closed because of an emergency within thirty days after the emergency ends.

**Definition:**

Emergency: Any unforeseen occurrence endangering life, limb, or property.

- Obtain a department variance before permanently removing any bridge or trestle walkway from use after October 1, 2002 (the effective date of this rule).

**Note:** The requirements for filing a variance are located in the Safety and health core rules, chapter 296-350 WAC, and WISHA appeals, penalties, and other procedural rules.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20020, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20030 Install radiation detectors according to manufacturer's specifications.**

**IMPORTANT.**

This section applies only to those private yards and plants where the installation of radiation detectors beside railroad tracks is required due to the nature of the business; for example, scrap metal yards.

**You must:**

- Install radiation detectors beside the railroad tracks in your yard and/or plant according to the manufacturer's specifications.
- Post signs on each radiation detector installed less than eight feet six inches from the centerline of the track:
  - Warning employees that the side clearances between the detector and the track centerline are less than the required standard minimum side clearances found in this chapter
  - Prohibiting employees from riding on the side of any rail car passing through the detector.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20030, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20040 Maintain overhead clearances.**

**Exemption:**

Engine houses and car shops are exempt from the overhead clearance requirements of this section.

**You must:**

- Make sure overhead railroad clearances are at least twenty-two feet six inches unless a clearance requirement found in Table 1 applies.

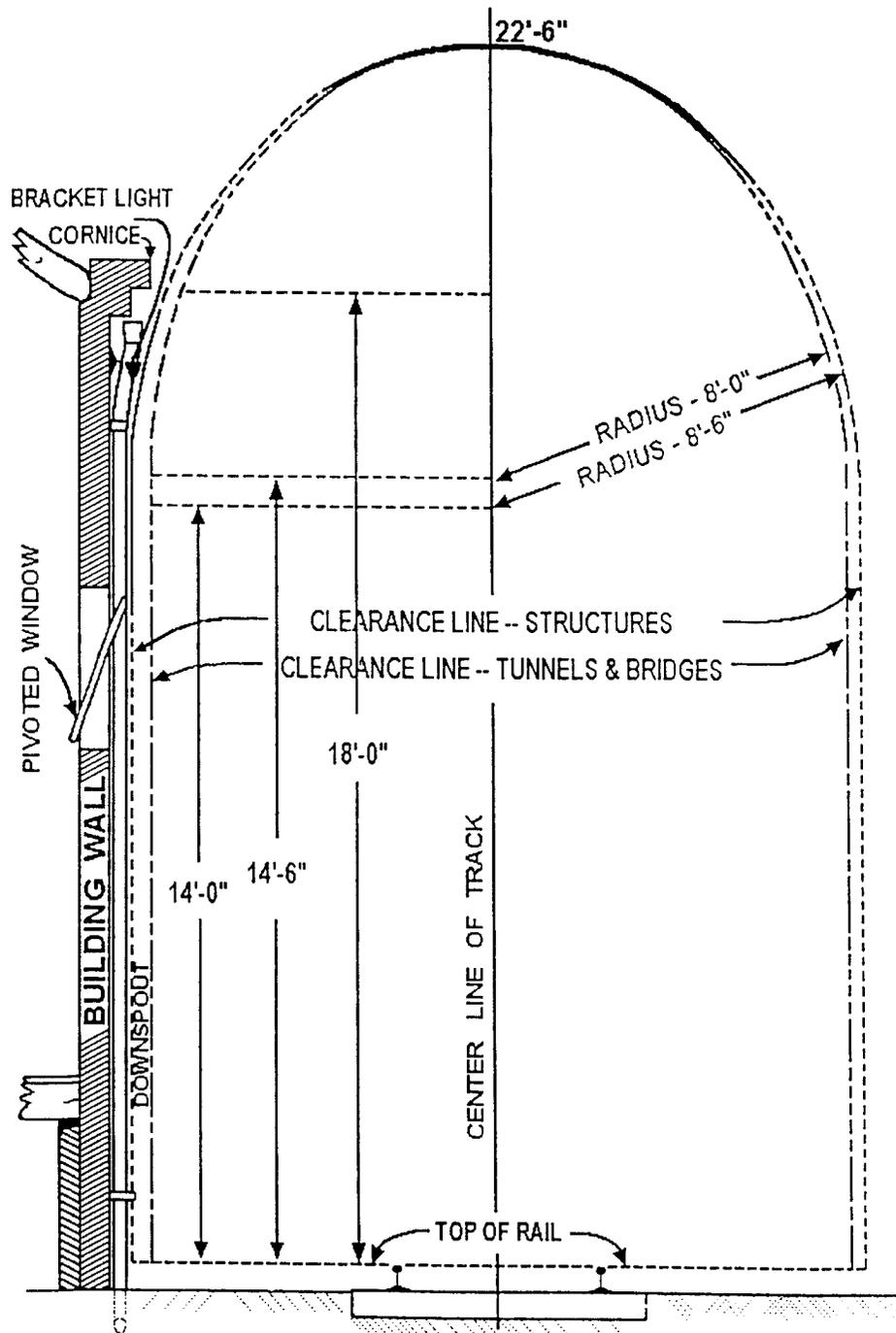
**Note:**

- Clearance requirements are based on the assumption that generally used rail equipment in private yards and plants is no more than ten feet ten inches wide by fifteen feet six inches high.
- WAC 296-860-10060 regulates the use of any rail equipment that exceeds the above dimensions.
- Minimum vertical clearances for all overhead wires are specified in Parts 1, 2, and 3 of the National Electrical Safety Code (NESC) as referenced in WAC 296-45-045, electrical workers safety rules, NESC applicable. See NESC 231 and 232.

**Table 1 - Minimum Overhead Clearances for Buildings, Structures, Tunnels, and Bridges**

<b>If your overhead clearance involves:</b>	<b>Then the minimum overhead clearance requirements are:</b>
An entirely enclosed building	18 feet when tracks end inside an entirely enclosed building. Also: <ul style="list-style-type: none"> <li>• The department must approve any reduction from 22 feet 6 inches before the reduction takes place.</li> <li>• If an overhead clearance is less than 22 feet 6 inches, all cars, locomotives or other equipment must come to a full stop before entering the building.</li> <li>• See Illustration 1.</li> </ul>
All other structures	Defined by the half-circumference of a circle whose: <ul style="list-style-type: none"> <li>• Radius is 8 feet 6 inches</li> <li><b>AND</b></li> <li>• Center is located on a line perpendicular to the track's centerline and 14 feet above the top of the highest rail.</li> <li>• See Illustration 1.</li> </ul>
Tunnels, over-crossings, and bridges	Defined by the half-circumference of a circle whose: <ul style="list-style-type: none"> <li>• Radius is 8 feet</li> <li><b>AND</b></li> <li>• Center is located on a line perpendicular to the track's centerline and 14 feet 6 inches above the top of the highest rail.</li> <li>• See Illustration 1.</li> </ul>

Illustration 1 - Minimum Overhead Clearances for Buildings, Structures, Tunnels, and Bridges



[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20040, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20050 Maintain side clearances.**

**You must:**

- Make sure side clearances are at least eight feet six inches from the track centerline unless clearance requirements found in Tables 2, 3, or 4 apply.

**Note:** All side clearances in Tables 2, 3, and 4 that reference "the track centerline" are based on the assumption that private

rail operations generally use track that is standard gauge width (4 feet 8 1/2 inches).

Table 2 - Minimum Side Clearance for Platforms

If Your Platform Type is:	Then the Minimum Clearance Requirements Between the Track Centerline and a Platform Edge are:
<b>Type 1</b> Platforms with heights of 8 inches or less above the top of the rail.	4 feet 8 inches See Illustration 2.
<b>Type 2</b> Platforms with heights of 4 feet or less above the top of the rail.	7 feet 3 inches See Illustration 2.
<b>Type 3</b> Platforms with heights of 4 feet 6 inches or less above the top of the rail and the platforms are used primarily for loading and/or unloading refrigerator cars.	8 feet See Illustration 2.
<b>Type 4</b> Icing platforms and supports.	7 feet 3 inches See Illustration 2.
<b>Type 5</b> Retractable platforms attached to permanent structures.	When not in use, use the clearance requirements for a platform of its height.
<b>Type 6</b> <b>Platforms that are a combination</b> of Types 1 through 3. (Only Types 1 through 3 platforms can be combined.)	<b>Platforms may be combined</b> if the Type 1 platform has a level surface no more than 4 feet 8 inches from the track centerline to the face of the platform wall with which it is combined.

Illustration 2 - Minimum Side Clearances for Platforms

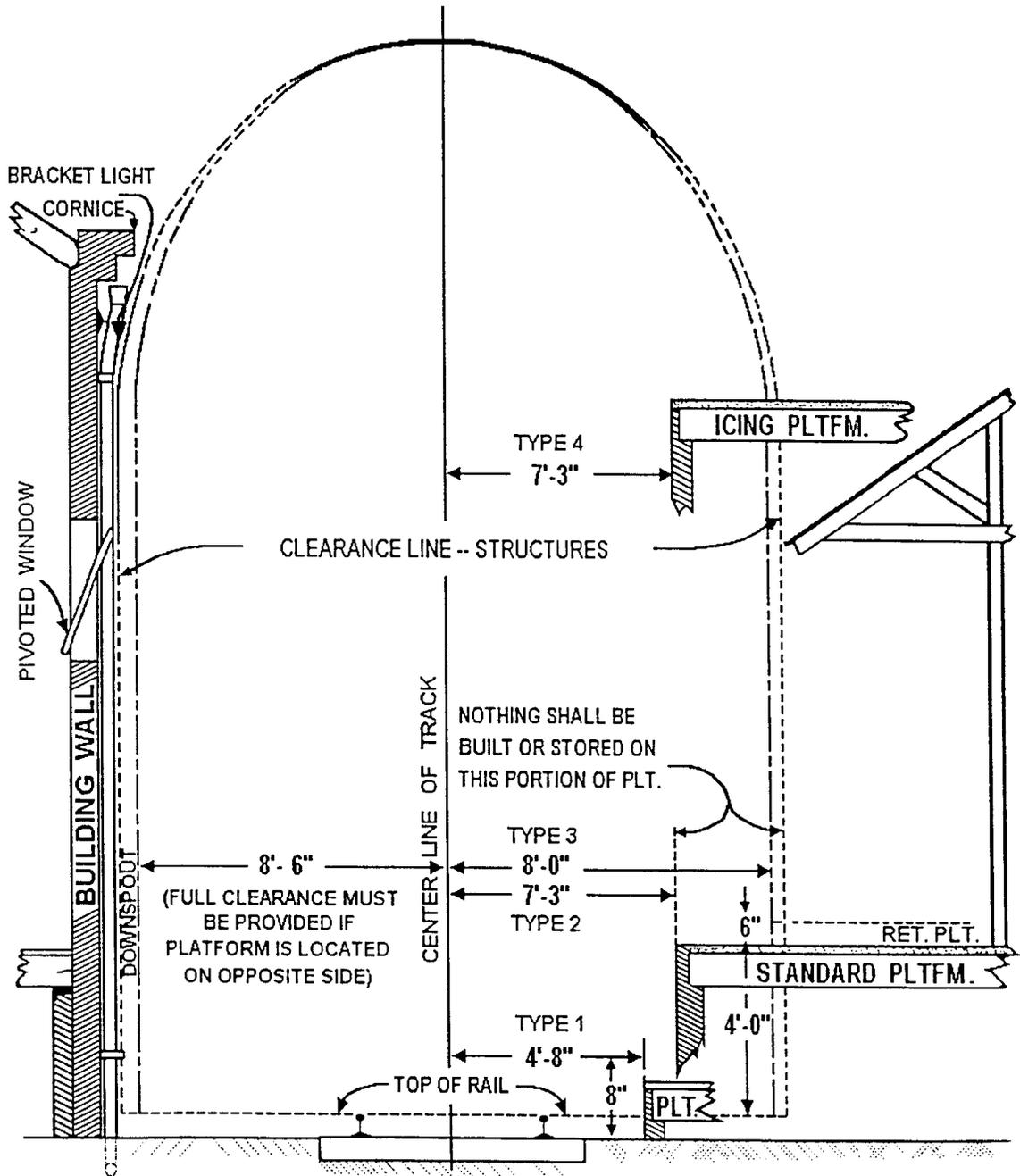


Table 3 - Minimum Side Clearances for Bridges, Tunnels and Related Structures

- Exemption:** • Except for handrail and water barrel clearances, the clearance requirements in Table 3 do not apply to bridge decks where railroad employees couple or uncouple cars on a switching lead unless the department approves them.
- Note:** • The requirements for filing a variance are located in the Safety and health core rules, chapter 296-350 WAC, and WISHA appeals, penalties and other procedural rules.

If your side clearance requirement involves:	Then the minimum side clearance requirements between the track centerline and the bridge, tunnel or related structure are:
Bridge and tunnel sides - lower section	8 feet
Bridge and tunnel sides - upper section	Defined by the half-circumference of a circle whose: <ul style="list-style-type: none"> <li>• Radius is 8 feet</li> </ul> AND

<p><b>If your side clearance requirement involves:</b></p>	<p><b>Then the minimum side clearance requirements between the track centerline and the bridge, tunnel or related structure are:</b></p>
	<ul style="list-style-type: none"> <li>• Center is located on a line perpendicular to the track's centerline and 14 feet 6 inches above the top of the highest rail.</li> <li>• See Illustration 3.</li> </ul>
<p>Related structures on bridges and in tunnels - lower section structures (or portions of them) that are no more than 4 feet above the top of the rail. For example:</p> <ul style="list-style-type: none"> <li>• Refuge platforms on bridges and trestles.</li> <li>• Water columns, oil columns, and block signals.</li> <li>• Cattle chutes.</li> </ul>	<p>Defined by lines extending:</p> <ul style="list-style-type: none"> <li>• 5 feet laterally from the track centerline to a point level with the top of the rail and then diagonally upward to another point 4 feet above the top of the rail <b>AND</b> 8 feet laterally from the track centerline to a point 4 feet above the top of the rail.</li> <li>• See Illustration 3A. The shaded portion of the illustration designates the area that must be free of refuge platforms, water columns, oil columns, block signals and cattle chutes.</li> </ul>
<p>Hand rails and water barrels</p>	<p>7 feet 6 inches</p>
<p>Fences of cattle guards</p>	<p>6 feet 9 inches</p>

Illustration 3 - Minimum Side Clearances for Bridges, Tunnels and Related structures

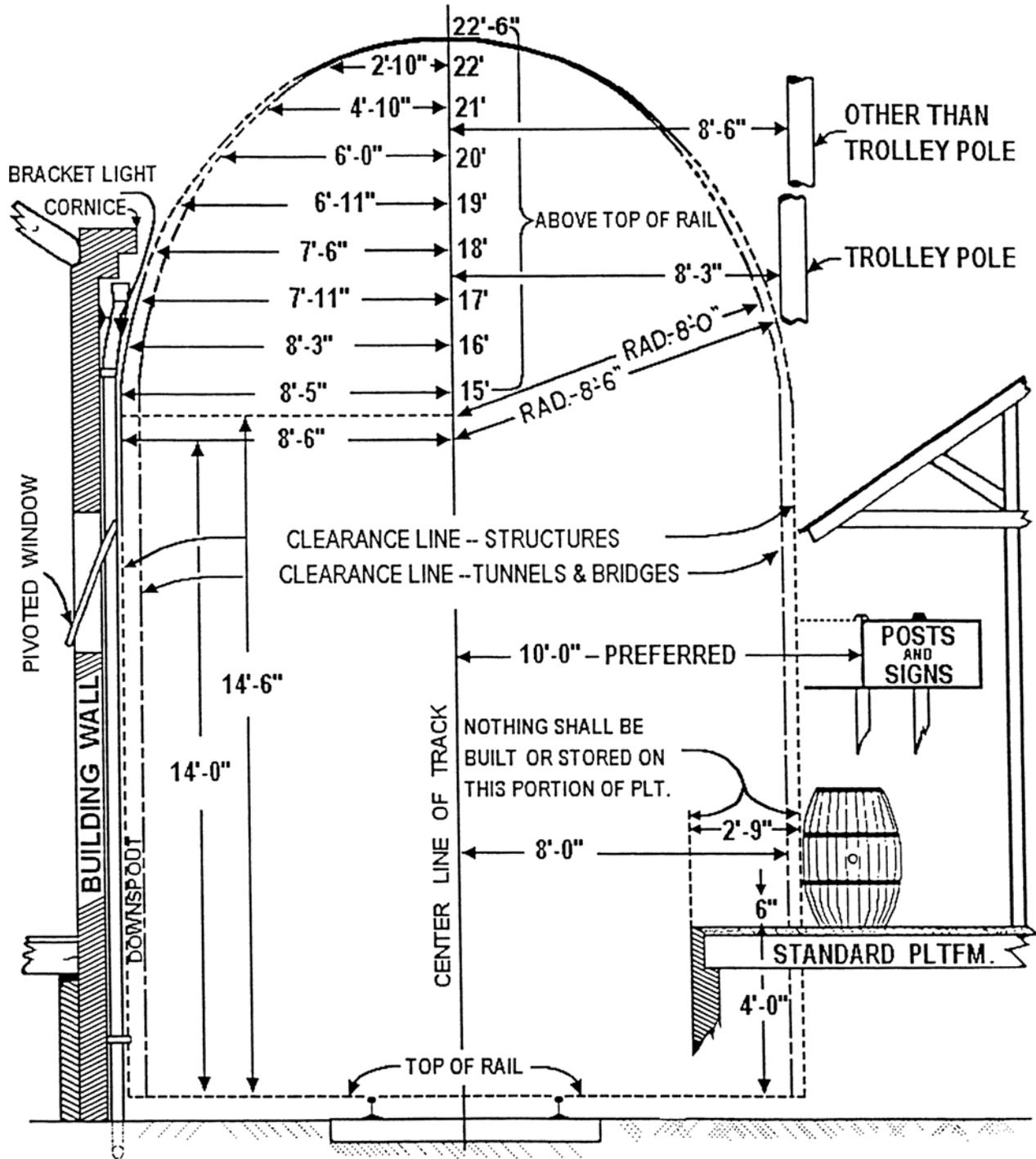
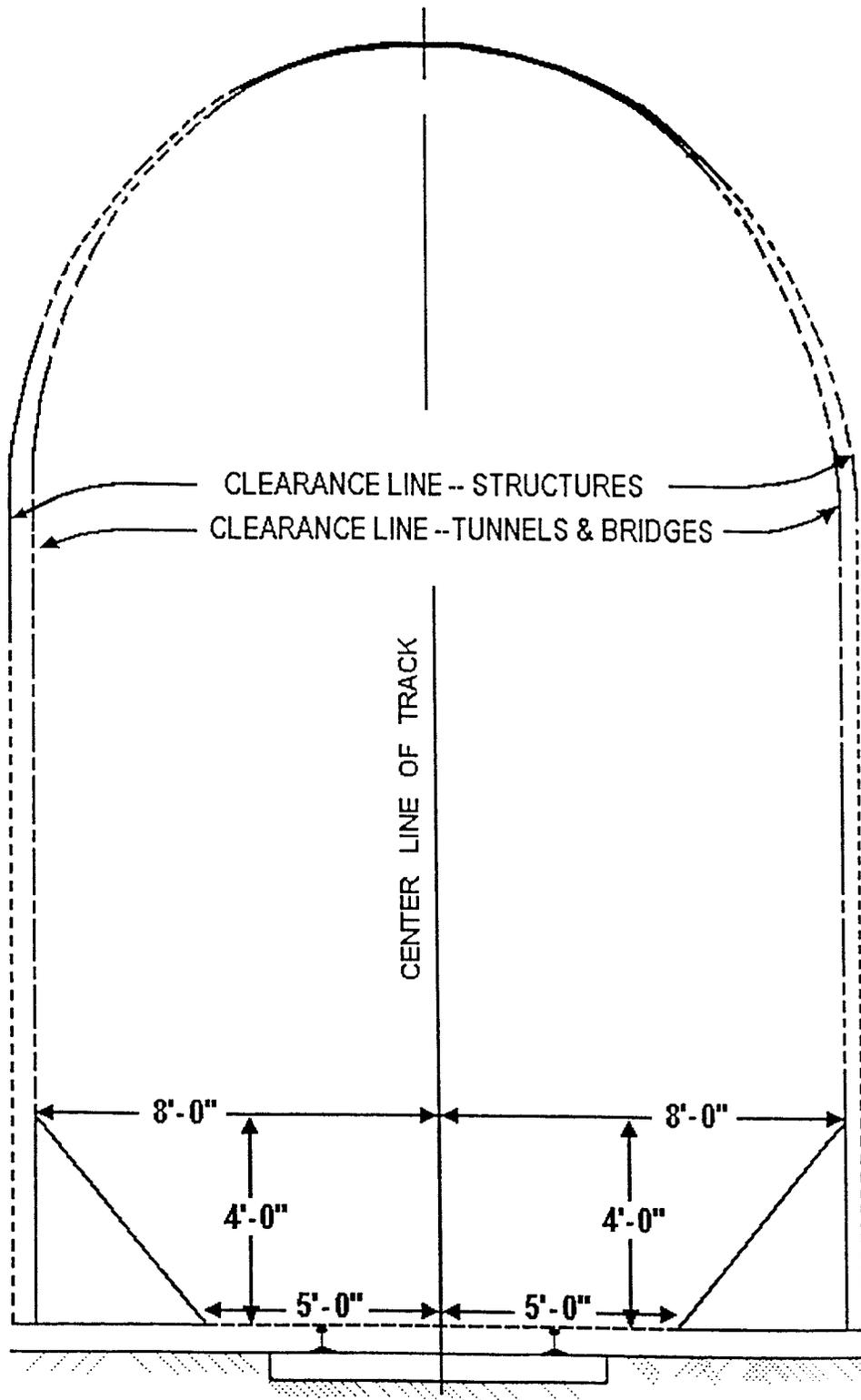


Illustration 3A - Minimum Side Clearance for Certain Structures in or on the Lower Sections of Bridges and Tunnels



**Table 4 - Other Minimum Side Clearance Requirements\***

- Note:**
- The department must approve all minimum clearances for car pulling units and related structures.
  - The requirements for filing a variance are located in the Safety and health core rules, chapter 296-350 WAC, and the WISHA appeals, penalties and other procedural rules.

<b>If your side clearance requirement involves:</b>	<b>Then the minimum side clearance requirements from the track centerline are:</b>
<b>Type A</b> Engine house and car repair shop doors.	7 feet 6 inches
<b>Type B</b> Interlocking mechanism, switch boxes, and other similar devices projecting no more than 4 feet above the top of the rail.	3 feet
<b>Type C</b> Poles supporting trolley contact.	8 feet 3 inches
<b>Type D</b> Signals and switch stands no more than 3 feet high and located between tracks where it is not possible to allow other clearances required in this chapter.	6 feet
<b>Type E</b> Signals and switch stands other than those described in Type B and Type D.	8 feet
<b>Type F</b> Material, merchandise, inventory, storage bins or equipment stacked or stored on ground or platforms adjacent to tracks.	8 feet 6 inches  <b>Note:</b> This requirement does not apply to: <ul style="list-style-type: none"> <li>• Railroad maintenance operations</li> <li>• Emergency situations</li> <li>• Local conditions that make compliance impossible.</li> </ul>
<b>Type G</b> Space adjacent to curved track.	Increased to equal tangent track clearances. As a general rule, side clearances on curved track should be increased 1-1/2" for each degree of curvature.

\*Table 4 does not have an accompanying illustration.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20050, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20060 Maintain clearances between tracks.**

**You must:**

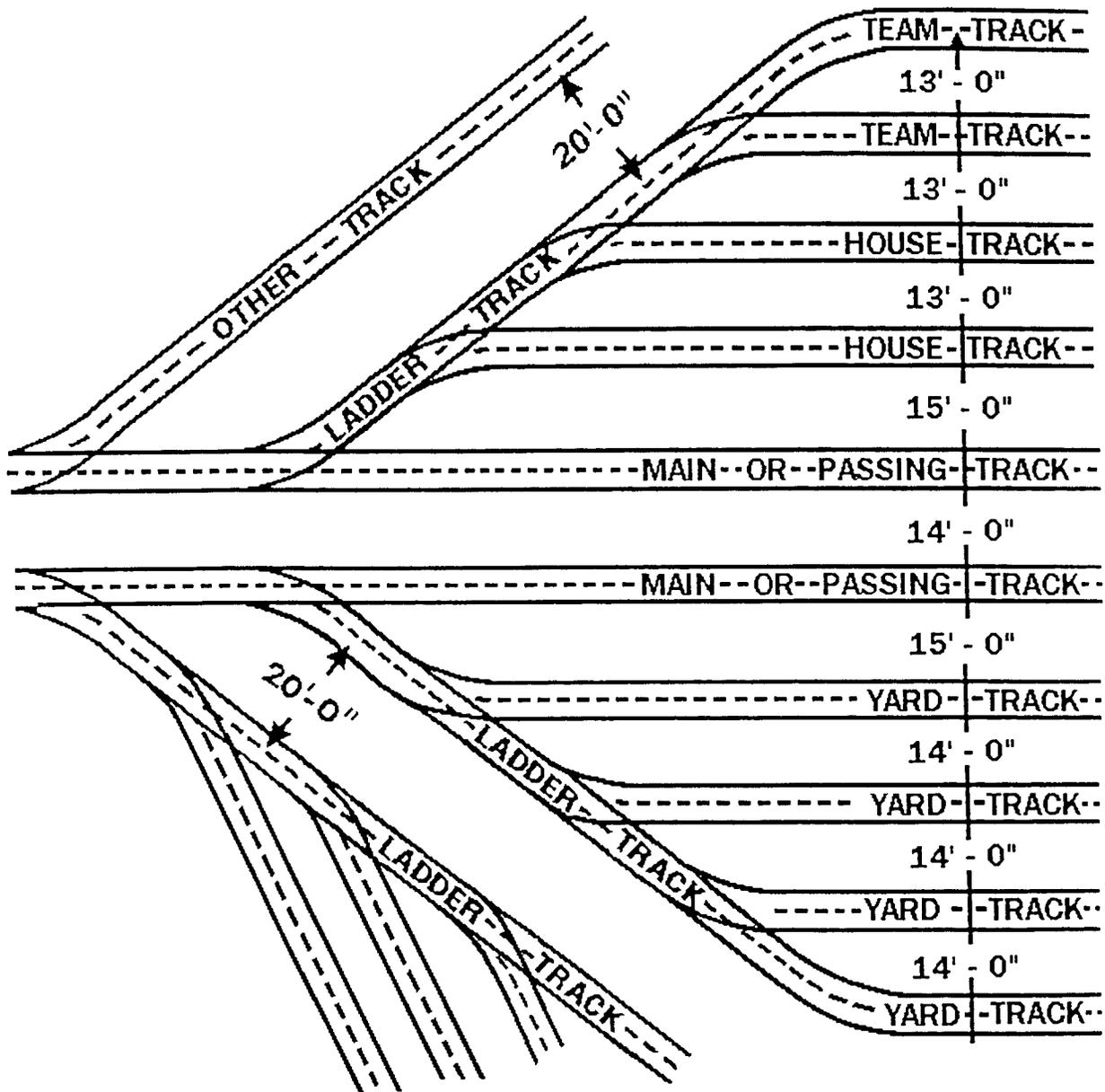
- Comply with the track clearance requirements in Table 5.

**Table 5 - Minimum Standard Gauge Track Clearances**

<b>If your track clearance involves:</b>	<b>Then the minimum clearance requirements between centerlines of standard gauge parallel tracks are:</b>
Main or passing tracks used for transporting cars, locomotives, motors, or like equipment	14 feet
Any tracks adjacent to main or passing tracks	15 feet
Team, house, or industry tracks	13 feet
Yard tracks	14 feet
Ladder and other tracks	20 feet

- Note:** The following illustration will help you understand the track clearance requirements discussed in this section and WAC 296-860-20080 regulating narrow gauge rail operations.

STANDARD GAUGE TRACK CLEARANCES



[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20060, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20070 Move excessive height or width rail car loads with care.**

**Note:** This section regulates rail cars whose dimensions exceed ten feet ten inches wide by fifteen feet six inches high.

**You must:**

- Make sure your yard supervisor is given advanced notice regarding the arrival of any excess height or width cars so they can safeguard any employees working in the yard.
- Make sure no one is allowed to ride on the:
  - Roof of any excessive height car
  - Side of any excessive width car
  - Side of any car with a load extending more than five feet five inches from the car's centerline.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20070, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-20080 Follow these requirements to conduct narrow gauge rail operations.**

**You must:**

- Base your clearance measurements upon your widest narrow gauge cars.
- Make sure the distance between the cars and objects on narrow gauge track is equal to or greater than the distance required between ten foot ten inch wide cars and other cars or objects on standard gauge track.
- Comply with all other applicable requirements in this chapter.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-20080, filed 8/21/02, effective 10/1/02.]

**WAC 296-860-300 Definitions.** The following definitions apply to this chapter.

**Car width** - Twice the distance from the centerline of a railroad car to its extreme outside part.

**Common carrier** - All railroads, railroad companies, street railroads, street railroad companies, corporations, partnerships, persons, cities or towns that own, operate, manage, or control any public use enterprise within Washington state that transports people or property for hire.

**Department** - The Washington state department of labor and industries.

**Emergency** - Any unforeseen occurrence that endangers life, limb, or property.

**Icing platforms** - Structures used to ice, precool, heat, ventilate or service private railroad cars that handle commodities requiring these services.

**Over-crossing** - Any point or place where a highway, road, or ramp carrying vehicular traffic crosses a private rail yard or track by passing above it.

**Overhead clearance** - The perpendicular distance between the top of the highest rail and the lowest point of an overhead structure or obstruction.

**Private rail operation** - A nonrailroad company operating railroad facilities, structures, tracks and equipment in the company's yard or plant. Chapter 296-860 WAC applies to:

- Any equipment, facility or structure owned or operated by the company

**AND**

- The construction and reconstruction of tracks or structures adjacent to any facility or structure owned or operated by the company.

**Railroad** - Every public use railroad, other than street railroads, operated to transport people or property for hire. This definition also includes all bridges, ferries, tunnels, equipment, switches, spurs, tracks, stations, and terminal facilities of every kind that are used, operated, controlled, or owned by or in connection with any such public use railroad.

**Side clearance** - The shortest distance between the centerline of a track and a structure or other track side obstructions such as downspouts, ladders, equipment, piles of material or inventory, etc.

**Track clearance** - The shortest distance between the centerlines of adjacent railroad tracks.

**Walkways** - Pathways located alongside or in the vicinity of a railroad track, or on a trestle or bridge, providing space so a private railroad employee can perform duties associated with the track, trestle, or bridge.

[Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. 02-17-106, § 296-860-300, filed 8/21/02, effective 10/1/02.]

**Chapter 296-863 WAC**

**FORKLIFTS AND OTHER POWERED INDUSTRIAL TRUCKS**

**WAC**

296-863-10005	Scope.
296-863-200	Design, construction, and equipment.
296-863-20005	Make sure PITs meet design and construction requirements.
296-863-20010	Meet these requirements when modifying or altering PITs.
296-863-20015	Make sure PITs are properly labeled.
296-863-20020	Protect operators from falling objects.

(2007 Ed.)

296-863-20025	Provide fall protection on order pickers.
296-863-20030	Provide directional lights on PITs when required.
296-863-20035	Make sure liquefied petroleum gas (LPG) fueled PITs meet these requirements.
296-863-20040	Meet these requirements when converting gasoline fuel PITs to liquefied petroleum gas (LPG) fuel.
296-863-300	Inspection, repair, maintenance, and servicing.
296-863-30005	Make sure PITs are in safe working condition.
296-863-30010	Inspect your PITs.
296-863-30015	Meet these requirements when repairing PITs.
296-863-30020	Maintain your PITs properly.
296-863-30025	Service gasoline fueled PITs safely.
296-863-30030	Service liquefied petroleum gas (LPG) fueled PITs safely.
296-863-30035	Make sure battery charging areas are safe.
296-863-30040	Service batteries for electric PITs safely.
296-863-400	Operations.
296-863-40005	Protect employees around PITs.
296-863-40010	Operate PITs safely.
296-863-40015	Make sure PIT loads are carried safely.
296-863-40020	Meet these requirements when the operator leaves the normal operating position.
296-863-40025	Meet these requirements when operating near railroad tracks.
296-863-40030	Meet this requirement when using motorized hand trucks.
296-863-40035	Meet these requirements when using elevators.
296-863-40040	Meet these requirements when using dockboards (bridge plates).
296-863-40045	Meet these requirements when loading or unloading railroad cars with a PIT.
296-863-40050	Meet these requirements when loading or unloading highway trucks with PITs.
296-863-40055	Meet these additional requirements when operating liquefied petroleum gas (LPG) fueled PITs.
296-863-40060	Make sure work platforms and PITs used to lift people meet these requirements.
296-863-40065	Operate PITs using elevated work platforms safely.
296-863-500	Hazardous (classified) locations.
296-863-50005	Use the appropriate PITs in hazardous (classified) locations.
296-863-600	Training.
296-863-60005	Make sure PIT operators are trained.
296-863-60010	Retrain PIT operators as required.
296-863-60015	Evaluate PIT operators performance.
296-863-700	Definitions.

**WAC 296-863-10005 Scope.** This chapter applies to powered industrial trucks that use electric motors or internal combustion engines. This includes, but is not limited to:

- Fork trucks.
- Forklifts.
- Tractors.
- Platform lift trucks.
- Motorized hand trucks.
- Other specialized industrial trucks.

**Definition:**

A powered industrial truck (PIT) is a mobile, power-driven vehicle used to carry, push, pull, lift, stack, or tier material.

**Exemption:** This chapter does not apply to:

- Compressed air-powered industrial trucks.
- Nonflammable compressed gas-operated industrial trucks.
- Vehicles covered by chapter 296-307 WAC, Safety standards for agriculture.
- Vehicles intended primarily for earth moving or over-the-road hauling.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-10005, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-200 Design, construction, and equipment.**

**Summary:**

**Your responsibility:**

To make sure PITs are properly designed, constructed, and equipped.

**You must:**

**Design and construction**

Make sure PITs meet design and construction requirements

WAC 296-863-20005.

Meet these requirements when modifying or altering PITs

WAC 296-863-20010.

**Labeling**

Make sure PITs are properly labeled

WAC 296-863-20015.

**Equipment**

Protect operators from falling objects

WAC 296-863-20020.

Provide fall protection on order pickers

WAC 296-863-20025.

Provide directional lights when required

WAC 296-863-20030.

**Liquefied petroleum gas (LPG) PITs**

Make sure liquefied petroleum gas (LPG) fueled PITs meet these requirements

WAC 296-863-20035.

Meet these requirements when converting gasoline fuel PITs to liquefied petroleum gas (LPG) fuel

WAC 296-863-20040.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-200, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20005 Make sure PITs meet design and construction requirements.**

**You must:**

- Make sure PITs meet American National Standards Institute (ANSI) design and construction requirements.

- Make sure PITs manufactured **before** March 1, 2000, meet the requirements of ANSI B56.1-1969, Safety Standards for Powered Industrial Trucks.

- Make sure PITs manufactured **on or after** March 1, 2000, meet the requirements of ANSI B56.1-1993, Safety Standards for Powered Industrial Trucks.

- Make sure rough terrain forklift trucks manufactured on or after January 1, 2005, meet the design and construction requirements of ANSI B56.6-1992, Safety Standard for Rough Terrain Forklift Trucks.

**Note:** There may be a nameplate on the PIT or a statement in the instruction manual indicating that the PIT meets the requirement of the appropriate ANSI standard. If in doubt, check with the manufacturer.

ANSI B56.1-1993 and B56.6-1992 are available by:

– Purchasing copies by writing:

American National Standards Institute

11 West 42nd Street

New York, NY 10036

**OR**

– Contacting the ANSI web site at [www.ansi.org](http://www.ansi.org).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20005, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20010 Meet these requirements when modifying or altering PITs.**

**You must:**

Have written approval from the PIT manufacturer before making any modifications to the PIT that:

- Change the relative position of the various parts of the PIT from what they were when originally received from the manufacturer.

- Add extra parts not provided by the PIT manufacturer.

- Eliminate any parts.

- Affect capacity or safe operation.

**Exemption:** This does not apply to converting PITs from gasoline to LPG fuel.

**You must:**

- Make sure any modifications or additions to the PIT are shown on the plates, tags, or decals to reflect any changes in the PITs:

- Capacity.

- Operation.

- Maintenance instructions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20010, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20015 Make sure PITs are properly labeled.**

**You must:**

- Make sure all PIT nameplates as well as any stickers, stencils or marks that relate to the stability and safety of the PIT are:

- In place.

- Legible.

**Note:** PITs should have a nameplate installed by the manufacturer that contains at least the following information:

- Model and serial number.

- Approximate weight of the PIT.

- Certification that the manufacturer has met the mandatory requirements of ANSI B56.1 Safety Standards for Powered Industrial Trucks.

- Type designation to show the PIT meets the applicable requirements of a nationally recognized testing laboratory.

**You must:**

- Make sure PITs approved for hazardous (classified) locations have a label or some other identifying mark indicating acceptance by a nationally recognized testing laboratory.

- Make sure PITs with front-end attachments, including fork extensions, are marked to:

- Identify the attachment.

- Show the approximate combined weight of the PIT and attachment.

- Show the maximum capacity of the PIT with attachments at their highest elevation and the load laterally centered.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20015, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20020 Protect operators from falling objects.**

**You must:**

- Use an overhead guard to protect operators from falling objects such as small packages, boxes, and bagged material.

**Exemption:** A high lift rider truck may be operated without the guard, providing all of the following conditions are met:

- Vertical movement of the lifting mechanism is restricted to seventy-two inches (1800 mm) or less from the ground.

- The high lift rider truck will operate only in an area where:
  - The top of a tiered load will not be more than one hundred twenty inches (3000 mm) high.
  - The bottom of a tiered load will not be more than seventy-two inches (1800 mm) high.
  - Only stable loads are handled.
  - The operator is protected from objects falling from high stack areas.

**Note:** The overhead guard is not intended to withstand the impact of a maximum capacity load of the PIT.

**You must:**

- Equip all high lift rider trucks with overhead guards that meet the design and construction requirements of American National Standards Institute (ANSI) B56.1-1993, Safety Standards for Powered Industrial Trucks.
- Use a vertical load backrest extension to keep all or any part of the load from falling backwards towards the operator if the load presents a hazard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20020, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20025 Provide fall protection on order pickers.**

**You must:**

- Make sure order pickers have either:
  - Standard guardrails on all open sides;

**OR**

- A safety harness and lanyard that are connected to a tie off point that has been approved by the PIT manufacturer.
- Make sure personal fall arrest equipment meets the requirements of WAC 296-24-87035, Appendix C—Personal fall arrest systems.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20025, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20030 Provide directional lights on PITs when required.**

**You must:**

- Provide PITs with directional lighting if the general lighting is less than two lumens per square foot.

**Note:**

- Lighting levels can be measured with a light meter.
- Conversion information: One foot-candle = one lumen incident per square foot = 10.76 lux.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20030, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20035 Make sure liquefied petroleum gas (LPG) fueled PITs meet these requirements.**

**You must:**

- Use fuel containers that meet **either** of the following minimum requirements:
  - A U.S. Department of Transportation (USDOT) approved container authorized for LP-gas service that has a minimum service pressure of two hundred forty pounds per square inch gage (psig);

**OR**

- A container Type 250 that has a design pressure of 312.5 psig.
  - Make sure fuel containers do not use variable liquid-level gages that require venting fuel to the atmosphere.
  - Make sure the fuel system of PITs **used inside buildings:**

(2007 Ed.)

- Has an approved automatic shutoff valve, located ahead of the inlet of the gas-air mixer, that will stop the flow of fuel to the mixer if the engine stops;

**AND**

- Use not more than two LP-gas fuel containers.
  - Make sure the fuel system of PITs **used outdoors** has an approved automatic shutoff valve, located ahead of the inlet of the gas-air mixer, that will stop the flow of fuel to the mixer if both:
    - The ignition is OFF.
    - The engine is not running.

**Note:** You may use an atmospheric type regulator (zero governor) as a shutoff valve if the PIT is used outdoors.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20035, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-20040 Meet these requirements when converting gasoline fuel PITs to liquefied petroleum gas (LPG) fuel.**

**You must:**

- Make sure PITs originally approved to use gasoline for fuel that are then converted to LPG fuel:
    - Meet the requirements for LP or LPS designated PITs;
- AND**
- Are converted using only approved equipment.

**Definitions:**

- **LP** refers to liquefied petroleum gas-powered trucks that, in addition to meeting all the requirements for type G trucks, have minimum acceptable safeguards against inherent fire hazards.
- **LPS** refers to liquefied petroleum gas powered trucks that in addition to meeting the requirements for LP type trucks, have additional exhaust, fuel, and electrical systems safeguards.

**Note:**

- Tables 1, 2, and 3 list the types of PITs and the locations where they can be used safely.
- The description of the component parts of the conversion system and the recommended method of installation on specific PITs are contained in the "Listed by Report" provided by the testing laboratory.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-20040, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-300 Inspection, repair, maintenance, and servicing.**

**Summary:**

**Your responsibility:**

To make sure PITs are kept in safe condition and properly serviced.

**References:**

- Appropriate respiratory protection may need to be used when operating PITs. See chapter 296-841 WAC, Respiratory hazards, for more information.
- Appropriate PPE may need to be worn. See WAC 296-800-160 in the *Safety and Health Core Rules* for more information.

**You must:**

**Inspect, repair and maintain PITs**

Make sure PITs are in safe working condition  
 WAC 296-863-30005.  
 Inspect your PITs  
 WAC 296-863-30010.  
 Meet these requirements when repairing PITs  
 WAC 296-863-30015.

Maintain your PITs properly  
WAC 296-863-30020.

**Service your PITs**

Service gasoline fueled PITs safely  
WAC 296-863-30025.

Service liquefied petroleum gas (LPG) fueled PITs safely

WAC 296-863-30030.

Make sure battery charging areas are safe  
WAC 296-863-30035.

Service batteries for electric PITs safely  
WAC 296-863-30040.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-300, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30005 Make sure PITs are in safe working condition.**

**You must:**

- Remove any PIT from service that is not in safe operating condition.
- Immediately remove PITs from service that have any of the following problems, and do not return them to service until the cause of the problem has been eliminated:
  - A leak in the fuel system.
  - A clogged water muffler screen or other muffler part.
  - An exhaust system that is emitting hazardous sparks or flames.
  - A part that is hotter than its normal operating temperature thus creating a hazardous condition.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30005, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30010 Inspect your PITs.**

**You must:**

- Inspect PITs according to the manufacturer's instructions.
  - Inspect PITs at these times:
    - Daily before being put into service;
- AND**
- After each shift, if the PIT is used on a continuous (twenty-four-hour) basis.

**Note:** You can designate someone on the off-going shift, on-coming shift, or some other person to do the inspection.

**You must:**

- Report and correct any deficiencies noted during the inspection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30010, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30015 Meet these requirements when repairing PITs.**

**You must:**

- Make sure repairs are made by authorized persons.
- Make sure replacement parts are equivalent to the parts used in the original design.
- Make sure repairs are not made in Class I, II, or III locations. See Tables 1, 2, and 3 for more information.

**Definitions:**

**Class I locations** are areas where flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

[Title 296 WAC—p. 3042]

**Class II locations** are areas where the presence of combustible dust could be sufficient to produce explosions.

**Class III locations** are areas where the presence of easily ignitable fibers are suspended in the air but are not in large enough quantities to produce ignitable mixtures.

**You must:**

- Make sure fuel and ignition system repairs that involve fire hazards are made only in locations designated for such repairs.
- Disconnect the battery before starting repairs to a PIT electrical system.
- Close the fuel container shutoff valve before repairing an LP-gas fueled PIT in a garage.

**Exemption:** The container shutoff valve may be left open if it is necessary to run the engine.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30015, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30020 Maintain your PITs properly.**

**You must:**

- Maintain PITs according to this chapter and the manufacturer's instructions.
- Keep PITs:
  - Clean.
  - Free of excess lint, oil, and grease.
- Take appropriate precautions to protect employees from the hazards associated with the cleaning agents or solvents used.
  - Precautions could include methods such as ventilation.
- Make sure solvents used for cleaning PITs have a flash point of 100° Fahrenheit or more.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30020, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30025 Service gasoline fueled PITs safely.**

**You must:**

- Handle and store liquid fuels, such as gasoline and diesel fuel, according to the National Fire Protection Association Flammable and Combustible Liquids Code (NFPA No. 30-1996).

**Note:** National Fire Protection Association codes are available by: Purchasing copies by writing:  
National Fire Protection Association  
1 Batterymarch Park  
Quincy, MA 02169-7471  
**OR**  
Contacting the NFPA web site at [www.nfpa.org](http://www.nfpa.org).

**You must:**

- Stop the engine before filling a fuel tank.
- Avoid spilling fuel during servicing.
- Make sure you do **not** use open flames to check the gasoline level in fuel tanks.
- Do the following before restarting the engine after fueling:
  - Put on the fuel tank cap.
  - Make sure spilled oil or fuel is completely washed away or evaporated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30025, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30030 Service liquefied petroleum gas (LPG) fueled PITs safely.****You must:**

• Handle and store liquefied petroleum gas fuel according to the National Fire Protection Association Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1998).

• Shut down the engine while fueling.  
• Fuel PITs equipped with permanently mounted fuel containers outdoors.  
• Make sure filling fuel containers from industrial bulk storage containers is done at least:

– Ten feet from the nearest masonry-walled building.  
– Twenty-five feet from the nearest building or other construction.

– Twenty-five feet from any building opening.  
• Make sure PITs are stored or serviced inside garages only when:

– There are no leaks in the fuel system;

**AND**

– The fuel tanks are not filled beyond the maximum filling density specified in WAC 296-24-47505 (12)(a), Storage and handling of liquefied petroleum gases.

**Reference:** See chapter 296-24 WAC, Part F-1, for LPG charging equipment requirements and maximum filling density and LPG service stations.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30030, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30035 Make sure battery charging areas are safe.****You must:**

• Make sure battery charging areas are designated and provided with all of the following:

– Means to flush and neutralize spilled electrolyte.  
– Fire protection.  
– Ventilation that is adequate to disperse fumes from gassing batteries.

• Prohibit smoking in battery charging areas.  
• Take precautions to prevent open flames, sparks, or electric arcs in battery charging areas.

• Protect battery charging equipment from being damaged by PITs.

• Provide at least one of the following to handle batteries:  
– Conveyor.  
– Overhead hoist.  
– Other equivalent material handling equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30035, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-30040 Service batteries for electric PITs safely.****You must:**

• Make sure PITs are properly positioned with the brake on before charging or changing batteries.

• Make sure you do **not** use open flames to check the electrolyte level in storage batteries.

• Do the following when charging batteries:  
– Make sure vent caps are functioning.  
– Open the battery or compartment covers to dissipate heat.

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– Pour acid into water, never pour water into acid.  
• Provide a carboy filter or siphon to handle electrolyte.  
• Keep tools and other metallic objects away from the top of uncovered batteries.  
• Make sure reinstalled batteries are properly positioned and secured.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-30040, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-400 Operations.****Summary:****Your responsibility:**

To operate your PITs safely.

**You must:****General operations**

Protect employees around PITs

WAC 296-863-40005.

Operate PITs safely

WAC 296-863-40010.

Make sure PIT loads are carried safely

WAC 296-863-40015.

Meet these requirements when the operator leaves the normal operating position

WAC 296-863-40020.

Meet these requirements when operating near railroad tracks

WAC 296-863-40025.

**Special operations**

Meet this requirement when using motorized hand trucks

WAC 296-863-40030.

Meet these requirements when using elevators

WAC 296-863-40035.

Meet these requirements when using dockboards (bridge plates)

WAC 296-863-40040.

Meet these requirements when loading or unloading railroad cars with a PIT

WAC 296-863-40045.

Meet these requirements when loading or unloading highway trucks with PITs

WAC 296-863-40050.

**Liquefied petroleum gas (LPG) fueled PITs**

Meet these additional requirements when operating liquefied petroleum gas (LPG) fueled PITs

WAC 296-863-40055.

**Personnel lifting**

Make sure work platforms and PITs used to lift people meet these requirements

WAC 296-863-40060.

Operate PITs using elevated work platforms safely

WAC 296-863-40065.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-400, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40005 Protect employees around PITs.****You must:**

• Make sure operators use restraint devices, such as seatbelts or lap-bars, when they are provided on the PIT.

• Make sure you do not allow people:

[Title 296 WAC—p. 3043]

- Under the elevated part of any PIT, whether it is loaded or empty;
- To put any part of their body between the uprights of the mast;
- OR**
- Outside the running lines of the PIT.
- Make sure you do not allow unauthorized people to ride on PITS.
- Make sure people riding on PITs have a safe place to ride.
- Make sure you do not allow stunt driving or horseplay.
- Make sure PITs are not driven up to anyone in front of a bench or other fixed object.
- Make sure access to fire aisles, stairways, and fire equipment is kept clear.
- Make sure there is sufficient headroom under overhead installations such as lights, pipes, and sprinkler systems to safely operate PITs.

**Reference:** PIT operations may cause the airborne concentration levels of carbon monoxide gas to increase. You have to keep the concentration levels below the levels specified in chapter 296-841 WAC, Respiratory hazards.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40005, filed 9/14/04, effective 2/1/05.]

#### **WAC 296-863-40010 Operate PITs safely.**

##### **You must:**

- Operate PITs according to the manufacturer's instructions.
- Make sure PIT operators do all of the following:
  - Obey all traffic regulations, including authorized workplace speed limits.
  - Yield the right of way to ambulances, fire trucks, and other vehicles in emergency situations.
  - Keep a safe distance of approximately three truck lengths from the PIT ahead.
  - Look in the direction they are going and keep a clear view of their path of travel.
  - Slow down and sound the horn at cross aisles and other locations where vision is obstructed.
  - Do not pass other PITs traveling in the same direction at intersections, blind spots, or other dangerous locations.
  - Keep a safe distance from the edge of ramps or platforms while on any of the following:
    - Elevated docks.
    - Elevated platforms.
    - Freight cars.
- Make sure operators keep PITs under control at all times, including doing all of the following:
  - Drive at a speed that allows the PIT to be stopped safely.
  - Drive more slowly on wet or slippery floors.
  - Reduce speed to a safe level while turning.
  - Avoid driving over loose objects.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40010, filed 9/14/04, effective 2/1/05.]

#### **WAC 296-863-40015 Make sure PIT loads are carried safely.**

##### **You must:**

[Title 296 WAC—p. 3044]

(1) Make sure loads are stable, safe and within the rated load capacity of the PIT.

(2) Do both of the following when picking up a load:

- Place the load engaging means under the load as far as possible.

- Tilt the mast carefully backwards to stabilize the load.

(3) Make sure not to tilt the load engaging means forward when it is elevated unless:

- Picking up a load;

**OR**

- Depositing a load on a rack or stack.

(4) Do both of the following when traveling with a load:

- Keep the load trailing if it obstructs the operator's forward view.

- Travel with the load upslope when climbing or descending slopes of more than ten percent.

(5) Do both of the following when climbing a slope:

- Tilt the load and load engagement means backwards if necessary to stabilize the load;

**AND**

- Raise the load and load engagement means only as far as necessary to clear the surface.

(6) Make sure PITS with attachments are operated as partially loaded trucks, even if they are **not** carrying a load.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40015, filed 9/14/04, effective 2/1/05.]

#### **WAC 296-863-40020 Meet these requirements when the operator leaves the normal operating position.**

##### **You must:**

- Make sure operators do the following when getting off the PIT:

- Fully lower the load engaging means.

- Neutralize the controls.

- Set the brakes.

- Make sure operators do the following when leaving a PIT unattended:

- Fully lower the load engaging means.

- Neutralize the controls.

- Shut off power.

- Set the brakes.

- Block the wheels, if parked on an incline.

**Note:** A PIT is unattended when the operator:

- Is more than twenty-five feet away;

**OR**

- Can not see the PIT.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40020, filed 9/14/04, effective 2/1/05.]

#### **WAC 296-863-40025 Meet these requirements when operating near railroad tracks.**

##### **You must:**

- Make sure PITs are driven diagonally across railroad tracks, whenever possible.

- Make sure PITs are parked eight feet six inches or more from the center of any railroad tracks.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40025, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40030 Meet this requirement when using motorized hand trucks.****You must:**

- Make sure motorized hand trucks enter elevators and other confining areas with the load end forward.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40030, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40035 Meet these requirements when using elevators.****You must:**

- Do both of the following when driving PITs onto an elevator:
  - Approach slowly.
  - Enter the elevator squarely after the elevator car is leveled.
- Do all the following after the PIT is positioned on the elevator:
  - Neutralize the controls.
  - Shut off the power.
  - Set the brakes.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40035, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40040 Meet these requirements when using dockboards (bridge plates).****You must:**

- Make sure dockboards are not overloaded:
  - Make sure they are strong enough to carry the load imposed on them.
  - Make sure loads do not exceed the dockboard's rated capacity.
- Do the following when using dockboards:
  - Drive slowly and carefully over dockboards.
  - Properly secure dockboards before driving on them.
- Make sure powered dockboards meet the design and construction requirements of U.S. Department of Commerce Commercial Standard CS 202-56 (1961) "Industrial Lifts and Hinged Loading Ramps."
  - Do the following when using portable dockboards:
    - Use anchors or other devices that will prevent slipping.
    - Make sure they have handholds or other effective means for safe handling.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40040, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40045 Meet these requirements when loading or unloading railroad cars with a PIT.****You must:**

- Check the railroad car flooring for breaks or weakness before driving on it.
  - Set the brakes and use wheel stops or other recognized positive protection to keep railcars from moving:
    - During loading or unloading operations;
- OR**
  - While dockboards (bridge plates) are in position.
- Meet these requirements when using PITs to open or close freight car doors:
  - The PIT has to have an approved device specifically designed to open and close doors.

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- The device has to be designed so that force will be applied to the door parallel to door travel.

- The PIT operator has to be trained to use the device and have full view of the operation.

- People must be kept clear while the door is being moved.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40045, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40050 Meet these requirements when loading or unloading highway trucks with PITs.****You must:**

- Check the truck or trailer flooring for breaks or weakness before driving on it.
- Prevent movement of trucks or trailers during loading or unloading by:
  - Setting the brakes;

**AND**

- Chocking or blocking the wheels.

- Exemptions:**
- You can use mechanical means instead of wheel chocks or blocks to secure the trailer to the loading dock.
  - Wheel chocks or blocks are not required when:
    - The mechanical means prevents the trailer from moving away from the dock.
    - The mechanical equipment is used and maintained as recommended by the manufacturer.
    - Damaged mechanical equipment is immediately removed from service.

- Note:** You may need to use fixed jacks to keep a semi-trailer that is not coupled to a tractor from up ending during loading or unloading.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40050, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40055 Meet these additional requirements when operating liquefied petroleum gas (LPG) fueled PITs.****You must:**

- Make sure you do not park PITs near:
  - Sources of heat, open flames, or similar ignition sources;

**OR**

- Open pits, such as service pits, that do not have adequate ventilation.

- Make sure PITs stored inside a garage do not have:

- A leak in the fuel system.

- Fuel containers filled beyond the maximum filling capacity.

**Reference:** See WAC 296-24-47505(12), Storage and handling of liquefied petroleum gases, for maximum filling capacities.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40055, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40060 Make sure work platforms and PITs used to lift people meet these requirements.****You must:**

- Make sure work platforms:
  - Are securely fastened to the lifting carriage or forks.
  - Have standard guardrails and toeboards on all sides.
- Guard the area between the platform and the PIT mast to prevent employee contact with chains or other shear points.

[Title 296 WAC—p. 3045]

- Make sure PITs used to elevate a work platform have a lift mechanism that can not drop faster than one hundred thirty five feet per minute in the event of a system failure.
- Make sure the lifting carriage or forks are prevented from tilting.

**Note:** Examples of how this may be accomplished are the use of:

- A control lever that prevents the inadvertent movement; or
- Use of a strap or other device to hold the control lever in position.

**You must:**

- Make sure PITs with controls (vertical only or horizontal and vertical) that can be elevated with the lifting carriage or forks, have a way for people on the platform to shut off power to the PIT.

**Note:** You can find the minimum requirements for standard railings of various types of construction in WAC 296-24-75011, Railings, toeboards and cover specifications.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40060, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-40065 Operate PITs using elevated work platforms safely.**

**You must:**

- Make sure the PIT operator:
  - Is attending the lift equipment when workers are on the platform.
  - Is in the normal operating position while raising or lowering the platform.

**Note:** A PIT is unattended when the operator:

- Is more than twenty-five feet away;
- OR**
- Cannot see the PIT.

**You must:**

- Make sure the operator does **not** move the PIT from one point to another while workers are on the platform.
  - The operator may inch or maneuver the PIT at very low speed with workers on the platform.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-40065, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-500 Hazardous (classified) locations.**

**Summary:**

**Your responsibility:**

To use PITs safely in hazardous (classified) locations.

**You must:**

Use the appropriate approved PITs in hazardous (classified) locations

WAC 296-863-50005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-500, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-50005 Use the appropriate PITs in hazardous (classified) locations.**

**You must:**

- Make sure PITS are used in hazardous (classified) locations as follows:
  - PITS authorized to be used in Class 1 locations are shown in Table 1, Approved PIT Use in Class 1 Locations.
  - PITS authorized to be used in Class 2 locations are shown in Table 2, Approved PIT Use in Class 2 Locations.
  - PITS authorized to be used in Class 3 locations are shown in Table 3, Approved PIT Use in Class 3 Locations.

[Title 296 WAC—p. 3046]

- PITS authorized to be used in unclassified locations are:

– Approved PITS designated as Type D, E, G, or LP;

**AND**

– PITS that meet the requirements of a Type D, E, G, or LP PIT.

**Definitions:**

- An unclassified location is an area that is not designated as a Class 1, 2, or 3 location.
- Designations means a code used to show the different types of hazardous (classified) locations where PITs can be safely used:

– **D** refers to trucks that are diesel engine powered that have minimum safeguards against inherent fire hazards.

– **DS** refers to diesel powered trucks that, in addition to meeting all the requirements for type D trucks, are provided with additional safeguards to the exhaust, fuel and electrical systems.

– **DY** refers to diesel powered trucks that have all the safeguards of the DS trucks and, in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.

– **E** refers to electrically powered trucks that have minimum acceptable safeguards against inherent fire hazards.

– **ES** refers to electrically powered trucks that, in addition to all of the requirements for the E trucks, have additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.

– **EE** refers to electrically powered trucks that have, in addition to all of the requirements for the E and ES type trucks, have their electric motors and all other electrical equipment completely enclosed.

– **EX** refers to electrically powered trucks that differ from E, ES, or EE type trucks in that the electrical fittings and equipment are designed, constructed and assembled to be used in atmospheres containing flammable vapors or dusts.

– **G** refers to gasoline powered trucks that have minimum acceptable safeguards against inherent fire hazards.

– **GS** refers to gasoline powered trucks that are provided with additional exhaust, fuel, and electrical systems safeguards.

– **LP** refers to liquefied petroleum gas-powered trucks that, in addition to meeting all the requirements for type G trucks, have minimum acceptable safeguards against inherent fire hazards.

– **LPS** refers to liquefied petroleum gas-powered trucks that in addition to meeting the requirements for LP type trucks, have additional exhaust, fuel, and electrical systems safeguards.

**Note:**

- Tables 1, 2, and 3 show the type of approved PITs that can be used in the appropriate divisions and groups.
- PITS cannot be used in divisions and groups that do not have a PIT designation listed.
- Approved PITs will be marked or labeled with the designation of the PIT. See WAC 296-863-20010, Make sure PITs are properly labeled.

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**Table 1**  
Approved PIT Use in Class 1 Locations

<b>Class 1</b> Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.							
<b>Division 1</b> Conditions exist continuously, intermittently, or periodically under normal operating conditions.				<b>Division 2</b> Conditions may occur due to accidentally, for example, due to a puncture of a storage drum.			
<b>Group A</b> Acetylene	<b>Group B</b> Hydrogen	<b>Group C</b> Ethyl ether	<b>Group D</b> Acetone Alcohols Benzene Gasoline Lacquer solvent	<b>Group A</b> Acetylene	<b>Group B</b> Hydrogen	<b>Group C</b> Ethyl ether	<b>Group D</b> Acetone Alcohols Benzene Gasoline Lacquer solvent
No PIT type can be used	No PIT type can be used	No PIT type can be used	Use this PIT type: <b>EX</b>	No PIT type can be used	No PIT type can be used	No PIT type can be used	Use this PIT type: <b>DS</b> <b>DY</b> <b>ES</b> <b>EE</b> <b>EX</b> <b>GS</b> <b>LPS</b>

**Table 2**  
Approved PIT Use in Class 2 Locations

<b>Class 2</b> Locations which are hazardous because of the presence of combustible dust.					
<b>Division 1</b> Explosive mixture may be present under normal operating conditions, or where failure of equipment may cause the condition to exist simultaneously with arcing or sparking of electrical equipment, or where dusts of an electrically conducting nature may be present.			<b>Division 2</b> Explosive mixture not normally present, but where deposits of dust may cause heat rise in electrical equipment, or where such deposits may be ignited by arcs or sparks from electrical equipment.		
<b>Group E</b> Metal dust	<b>Group F</b> Carbon black Coal dust Coke dust	<b>Group G</b> Grain dust Flour dust Starch dust Organic dust	<b>Group E</b> Metal dust	<b>Group F</b> Carbon black Coal dust Coke dust	<b>Group G</b> Grain dust Flour dust Starch dust Organic dust
No PIT type can be used	Use this PIT type: <b>EX</b>	Use this PIT type: <b>EX</b>	No PIT type can be used	Use this PIT type: <b>EX</b> <b>DY</b> <b>EE</b>	Use this PIT type: <b>DS</b> <b>DY</b> <b>ES</b> <b>EE</b> <b>EX</b> <b>GS</b> <b>LPS</b>

**Table 3**  
Approved PIT Use in Class 3 Locations

<b>Class 3</b> Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.	
<b>Division 1</b>	<b>Division 2</b>
Locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Locations in which easily ignitable fibers are stored or handled (except in the process of manufacture).
Use this PIT type: <b>DY</b> <b>EE</b> <b>EX</b>	Use this PIT type: <b>DS</b> <b>DY</b> <b>E</b> <b>ES</b> <b>EE</b> <b>EX</b> <b>GS</b> <b>LPS</b>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-50005, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-600 Training.**

**Summary:**

**Your responsibility:**

To make sure PIT operators are competent.

**You must:**

**Operator training**

Make sure PIT operators are trained

WAC 296-863-60005.

Retrain PIT operators as required

WAC 296-863-60010.

Evaluate PIT operators performance

WAC 296-863-60015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-600, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-60005 Make sure PIT operators are trained.**

**You must:**

- Make sure employees successfully complete an operator training program before operating PITs. The only time a trainee can operate a PIT is:

- Under the direct supervision of a person who has the knowledge, training, and experience to train and evaluate operators;

**AND**

- When operating the PIT does not endanger the trainee or other employees.

- Make sure training is done by you or someone you designate that has the knowledge, training, and experience to:

- Conduct the training;

**AND**

- Evaluate trainee competence.

- Make sure your operator training program consists of:

- Formal instruction.

- ■ Such as lecture and discussion, interactive computer learning, video tapes, and written material.

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- Practical training.

- ■ Such as demonstrations done by the trainer and practical exercises performed by trainees.

- Evaluation of trainee performance.

- Make sure the initial operator training program covers the subjects in Table 4, Required Training Topics.

**Note:** If an operator has previously received training specified in Table 4, Required Training Topics, additional training in that topic is not required if:

- The training was appropriate to the PIT and working conditions in your workplace;

**AND**

- The employee has passed a PIT performance evaluation within the last three years.

**Table 4**  
Required Training Topics

<b>Topics related to powered industrial truck</b>	<b>Topics related to your workplace</b>
• Operating instructions,	• Surface conditions where the PIT will be operated
• Warnings and precautions for the types of PIT the operator will be authorized to operate	• Composition of loads to be carried and load stability
• Differences between the PIT and the automobile	• Load manipulation, stacking, and unstacking
• PIT controls and instrumentation: Where they are located, what they do, and how they work	• Pedestrian traffic in areas where the PIT will be operated
• Engine or motor operation	• Narrow aisles and other restricted places where the PIT will be operated
• Steering and maneuvering	• Use of door opening and closing devices
• Visibility (including restrictions due to loading)	• Hazardous (classified) locations where the PIT will be operated
• Fork and attachment adaptation, operation, and use limitations	• Ramps and other sloped surfaces that could affect the PITs stability
• PIT capacity	• Closed environments and other areas where insufficient ventilation or poor PIT maintenance could cause a buildup of carbon monoxide or diesel exhaust
• PIT stability	• Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation
• Any PIT inspection and maintenance that the operator will be required to perform	
• Refueling	
• Charging and recharging of batteries	
• Operating limitations	

Topics related to powered industrial truck	Topics related to your workplace
<ul style="list-style-type: none"> <li>Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of PIT that the employee is being trained to operate</li> </ul>	

**You must:**

- Keep written records of operator training and evaluations that include the following information:
  - Name of the operator.
  - Date of the training.
  - Date of the evaluation.
  - Name of the person giving the training or evaluation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-60005, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-60010 Retrain PIT operators as required.****You must:**

- Provide PIT operators refresher training if **any** of the following occur:
  - The operator is involved in an accident or near-miss incident.
  - The operator is seen operating the PIT in an unsafe manner.
  - An evaluation shows the operator is not operating the PIT safely.
  - The operator is assigned to drive a different type or modified PIT.
  - Conditions in the workplace change that could affect safe operation of the PIT.

**Note:** Refresher training is required only in those topics where the operator has been found deficient.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-60010, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-60015 Evaluate PIT operators performance.****You must:**

- Evaluate PIT operators performance at each of these times:
  - As part of their initial training program.
  - After refresher training to determine the effectiveness of the training.
  - At least once every three years.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-60015, filed 9/14/04, effective 2/1/05.]

**WAC 296-863-700 Definitions.**

**ANSI** is an acronym for the American National Standards Institute.

**Authorized person (maintenance)** means a person who has been designated to perform maintenance on a PIT.

**Authorized person (training)** means a person approved or assigned by the employer to perform training for powered industrial truck operators.

**Approved** means listed or approved by a nationally recognized testing laboratory or a federal agency that issues approvals for equipment such as the Mine Safety and Health Administration (MSHA); the National Institute for Occupational Safety and Health (NIOSH); Department of Transportation; or U.S. Coast Guard, which issue approvals for such equipment.

**Bridge plate (dockboard)** means a device used to span the distance between rail cars or highway vehicles and loading platforms.

**Classified location or hazardous location** means areas that could be hazardous because of explosive or flammable atmospheres. These locations are broken down into the following categories:

- Class I** locations are areas where flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

- Class II** locations are areas where the presence of combustible dust could be sufficient to produce explosions.

- Class III** locations are areas where the presence of easily ignitable fibers are suspended in the air but are not in large enough quantities to produce ignitable mixtures.

**Counterweight** means a weight used to counteract or the load being carried by the truck, or to increase the load carrying capacity of a truck.

**Designations** means a code used to show the different types of hazardous (classified) locations where PITs can be safely used:

- D** refers to trucks that are diesel engine powered that have minimum safeguards against inherent fire hazards.

- DS** refers to diesel powered trucks that, in addition to meeting all the requirements for type D trucks, are provided with additional safeguards to the exhaust, fuel and electrical systems.

- DY** refers to diesel powered trucks that have all the safeguards of the DS trucks and, in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.

- E** refers to electrically powered trucks that have minimum acceptable safeguards against inherent fire hazards.

- ES** refers to electrically powered trucks that, in addition to all of the requirements for the E trucks, have additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.

- EE** refers to electrically powered trucks that have, in addition to all of the requirements for the E and ES type trucks, have their electric motors and all other electrical equipment completely enclosed.

- EX** refers to electrically powered trucks that differ from E, ES, or EE type trucks in that the electrical fittings and equipment are designed, constructed and assembled to be used in atmospheres containing flammable vapors or dusts.

- G** refers to gasoline powered trucks that have minimum acceptable safeguards against inherent fire hazards.

- GS** refers to gasoline powered trucks that are provided with additional exhaust, fuel, and electrical systems safeguards.

- LP** refers to liquefied petroleum gas-powered trucks that, in addition to meeting all the requirements for type G trucks, have minimum acceptable safeguards against inherent fire hazards.

• **LPS** refers to liquefied petroleum gas powered trucks that in addition to meeting the requirements for LP type trucks, have additional exhaust, fuel, and electrical systems safeguards.

**Electrolyte** means a chemical, usually acid, that is mixed with water to produce electricity.

**Flammable liquid** means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99% or more of the total volume of the mixture.

**Flashpoint** means the minimum temperature at which a liquid gives off enough vapor to ignite.

**Front-end attachment** means a device that is attached to the forks or lifting device of the truck.

**Lanyard** means a flexible line of webbing, rope, or cable used to secure a harness to an anchor point.

**Listed by report** means a reporting listing the field assembly, installation procedures, or both, for a UL listed product that does not have generally recognized installation requirements.

**Liquefied petroleum gas** means any gas that is composed predominantly of the following hydrocarbons, or mixtures of them; propane, propylene, butanes (normal butane or iso-butane), and butylenes.

**Load engaging** means a device attached to a powered industrial truck and used to manipulate or carry a load.

**Motorized hand truck** means a powered truck with wheeled forks designed to go under or between pallets and is controlled by a walking or riding operator.

**Nationally recognized testing laboratory** means an organization recognized by the Occupational Safety and Health Administration that conducts safety tests on equipment and materials.

**Order picker** means a truck controlled by an operator who is stationed on a platform that moves with the load engaging means.

**Powered industrial truck (PIT)** means a mobile, power-driven vehicle used to carry, push, pull, lift, stack, or tier material.

**Rough terrain forklift truck** means a truck intended to be used on unimproved natural terrain and at construction sites.

**Safety harness (full body harness)** means a configuration of connected straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration devices.

**Tie-off point (anchorage)** means a secure point to attach a lanyard that meets the requirements of WAC 296-24-87035, Appendix—C Personal fall arrest systems.

**Vertical load backrest extension** means a device that extends vertically from the fork carriage frame.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-19-051, § 296-863-700, filed 9/14/04, effective 2/1/05.]

## Chapter 296-864 WAC

### SPLIT (MULTIPIECE) RIM AND SINGLE-PIECE RIM WHEELS

#### WAC

296-864-100 Scope.

[Title 296 WAC—p. 3050]

296-864-200	Wheel components.
296-864-20005	Make sure wheel components are compatible.
296-864-20010	Make sure rim wheels are serviced safely.
296-864-20015	Make sure damaged wheel components are not used.

#### SPLIT (MULTIPIECE) RIM AND SINGLE-PIECE RIM WHEELS

296-864-300	Restraint devices.
296-864-30005	Use a restraining device.
296-864-30010	Make sure the restraint device meets these requirements.
296-864-30015	Provide charts or rim manuals.
296-864-400	Service split rim wheels safely.
296-864-40005	Establish a safe operating procedure for split rim wheels.
296-864-40010	Follow these procedures for demounting split rim wheels.
296-864-40015	Follow these procedures when working on split rim wheels and components.
296-864-40020	Follow these procedures for inflating split rim wheels.
296-864-500	Service single-piece rim wheels safely.
296-864-50005	Establish a safe operating procedure for single-piece rim wheels.
296-864-50010	Follow these procedures for demounting single-piece rim wheels.
296-864-50015	Follow these procedures when working on single-piece rim wheels and components.
296-864-50020	Follow these procedures for inflating single-piece rim wheels.
296-864-600	Employee training.
296-864-60005	Train employees who service rim wheels.
296-864-60010	Make sure employees demonstrate and retain the ability to service rim wheels safely.
296-864-700	Definitions.

### WAC 296-864-100 Scope.

**Note:** This rule is intended to protect employees from hazards associated with the exploding separation of rim wheel components.

This chapter applies to the protection of employees who service split rim wheels and single-piece rim wheels used on large vehicles. For example:

- Trucks;
- Tractors;
- Trailers;
- Buses;

AND

- Off-road machines.

**Exemption:** This chapter does not apply to the servicing of rim wheels used on:

- Automobiles;

OR

- Tires designated as light truck (LT).

**Note:** The tire designation can be found on the sidewall of the tire.

#### Definition:

**Split rim wheel or multipiece rim wheel,** means a wheel made up of two or more parts. One of the parts is a side ring or locking ring that holds the tire on the wheel when the tire is inflated.

**Single-piece rim wheel** means a single part holds the tire, forms part of the air chamber and is the point where the wheel is attached to the vehicle axle.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-100, filed 10/5/04, effective 2/1/05.]

### WAC 296-864-200 Wheel components.

#### Summary:

#### Your responsibility:

To make sure rim wheels are serviced safely.

#### You must:

Make sure wheel components are compatible

WAC 296-864-20005.

Make sure rim wheels are serviced safely

WAC 296-864-20010.

Make sure damaged wheel components are not used

WAC 296-864-20015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-200, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-20005 Make sure wheel components are compatible.**

**You must:**

- Make sure tires and rim wheels are compatible before assembly.
- Make sure split rim wheel components are not interchanged, except as provided in:

– The Occupational Safety and Health Administration (OSHA) and National Highway Traffic Safety Administration (NHTSA) charts, "*Demounting and Mounting Procedures for Truck/Bus Tires*" and "*Multi-Piece Rim Matching Chart*,"

**OR**

– The rim manual for that component.

**Note:** Reprints of these charts, "*Demounting and Mounting Procedures for Truck/Bus Tires*" and "*Multi-Piece Rim Matching Chart*," are available:

- Through the WISHA Training and Outreach office at 360-902-5638.
- Through the OSHA area offices. The address and telephone number of the nearest OSHA area office can be obtained by looking in the local telephone directory under U.S. Government, U.S. Department of Labor, Occupational Safety and Health Administration.
- From the OSHA web site at <http://www.osha.gov/pls/publications/pubindex.continue>.
- Through U.S. Postal Service at:  
Publications Office  
U.S. Department of Labor  
Room N3101  
Washington D.C. 20210.  
Telephone: 202-523-9667.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-20005, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-20010 Make sure rim wheels are serviced safely.**

**You must:**

- Inspect split rim wheel components and single-piece wheels prior to assembly.
- Make sure the following are free of any dirt, surface rust, scale or loose or flaked rubber build-up prior to mounting and inflation:

- Rim flanges;
- Rim gutters;
- Rings;
- Bead seating surfaces;

**AND**

- The bead areas of tires.
- Make sure you do not heat any rim wheels at any time.
- Make sure you do not repair any rim wheel that is:

- Cracked;
- Broken;
- Bent;

**OR**

– Damaged.

**Note:** Repair includes activities such as striking with a hammer and heating rim wheel components.

- Provide and make sure that an air line assembly consisting of the following components is used for inflating tires:
  - A clip-on chuck;
  - An in-line valve with a pressure gauge or a presettable regulator;

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**AND**

– A sufficient length of hose between the clip-on chuck and the in-line valve, if one is used, to allow the employee to stand outside the trajectory.

**Reference:** For additional requirements relating to compressed air tools, see WAC 296-807-140, Compressed air tools, in portable power tools.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-20010, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-20015 Make sure damaged wheel components are not used.**

**You must:**

• Make sure any wheel or wheel component that is bent out of shape, pitted from corrosion, broken or cracked is:

- Not used;
- Marked or tagged unserviceable;

**AND**

– Removed from the service area.

- Replace damaged or leaky valves.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-20015, filed 10/5/04, effective 2/1/05.]

**SPLIT (MULTIPIECE) RIM AND SINGLE-PIECE RIM WHEELS**

**WAC 296-864-300 Restraint devices.**

**Your responsibility:**

To make sure your restraint devices are safe.

**You must:**

Use a restraining device

WAC 296-864-30005.

Make sure the restraint device meets these requirements

WAC 296-864-30010.

Provide charts or rim manuals

WAC 296-864-30015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-300, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-30005 Use a restraining device.**

**You must:**

- Use a restraining device for inflating tires on split rim wheels.
- Use a restraining device or barrier for inflating tires on single-piece wheels.

**Exemption:** A restraining device or barrier is not required for single-piece rim wheels, if the rim wheel will be bolted onto a vehicle during inflation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-30005, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-30010 Make sure the restraint device meets these requirements.**

**You must:**

- Make sure the restraining device or barrier can withstand a rim wheel separation that occurs at one hundred fifty percent of the maximum tire pressure specified.
- Make sure the restraining devices and barriers will contain any components that may be thrown out during a wheel separation of any rim wheel.

- Make sure restraining devices and barriers are visually inspected:

- Prior to each day's use;

**AND**

- After any separation of the rim wheel components or sudden release of air.

- Make sure any restraining device or barrier that shows damage is immediately removed from service. Examples of damage include:

- Cracks at welds;

- Cracked or broken components;

- Bent or sprung components caused by mishandling, abuse, tire explosion or rim wheel separation;

- Pitting of components due to corrosion;

**OR**

- Other structural damage that would decrease its effectiveness.

- Make sure restraining devices or barriers removed from service are not used until they are repaired and reinspected.

- Make sure restraining devices or barriers that need structural repair are not used until they are certified by either:

- The manufacturer;

**OR**

- A registered professional engineer.

**Note:** The certification needs to show that the barrier can withstand a force of one hundred fifty percent of the maximum tire pressure in the event of wheel separation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-30010, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-30015 Provide charts or rim manuals.**

**You must:**

- Provide current charts or rim manuals containing instructions for the types of wheels being serviced in the service area.

- Provide and use only tools recommended in the rim manual for the specific type of rim wheel being serviced.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-30015, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-400 Service split rim wheels safely.**

**Your responsibility:**

To establish and use procedures to service split rim wheels safely.

**You must:**

Establish a safe operating procedure for split rim wheels WAC 296-864-40005.

Follow these procedures for demounting split rim wheels WAC 296-864-40010.

Follow these procedures when working on split rim wheels and components

WAC 296-864-40015.

Follow these procedures for inflating split rim wheels

WAC 296-864-40020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-400, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-40005 Establish a safe operating procedure for split rim wheels.**

**You must:**

- Establish a safe operating procedure for servicing split rim wheels that includes the procedures in WAC 296-864-40010 through 296-864-40020.

- Instruct employees in that procedure.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-40005, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-40010 Follow these procedures for demounting split rim wheels.**

**You must:**

- Follow the relevant procedures in Table 1, Procedures for Deflating Split Rim Wheels.

**Table 1**

**Procedures for Demounting Split Rim Wheels**

During these times	Then
Demounting rim wheels.	Make sure tires are completely deflated before demounting by removal of the valve core.
During either of the following situations:  – The tire has been driven underinflated at eighty percent or less of its recommended pressure;	Deflate the tires completely by removing the valve core, before a rim wheel is removed from the axle.
<b>OR</b> – There is obvious or suspected damage to the tire or wheel components.	

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-40010, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-40015 Follow these procedures when working on split rim wheels and components.**

**You must:**

- Follow the relevant procedures in Table 2, Procedures for Working on Split Rim Wheels and Components.

**Table 2**

**Procedures for Working on Split Rim Wheels and Components**

During these times	Then
A split rim wheel is in a restraining device.	Make sure employees do not rest or lean any part of the body or equipment on or against the restraining device.
Assembly of the wheel and inflation of the tire.	Apply rubber lubricant to bead and rim mating surfaces, unless the tire or wheel manufacturer recommends against it.
After tire inflation.	Do both of the following: Inspect the tire and wheel components while still within the restraining device; <b>AND</b>

**Table 2**  
**Procedures for Working on Split Rim Wheels and Components**

During these times	Then
	Make sure that they are properly seated and locked.
When adjusting the tire or wheel components.	Deflate the tire by removal of the valve core before the adjustment is made.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-40015, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-40020** Follow these procedures for inflating split rim wheels.

**You must:**

- Follow the relevant procedures in Table 3, Procedures for Inflating Split Rim Wheels.

**Table 3**  
**Procedures for Inflating Split Rim Wheels**

During these times	Then
Split rim wheels are being inflated.	Make sure employees stay out of the trajectory.
When all of the following occur:  A tire on a vehicle has more than eighty percent of the recommended pressure; <b>AND</b> Remote control inflation equipment is used; <b>AND</b> No employees are in the trajectory during inflation.	The tire may be inflated while the rim wheel is on the vehicle.
Assembly of the wheel and inflation of the tire.	Apply rubber lubricant to bead and rim mating surfaces, unless the tire or wheel manufacturer recommends against it.
Inflating tires outside of a restraining device.	Make sure you do not exceed 5 psi (pounds per square inch) to seat the bead.
The tire is pressurized.	Make sure you don't correct the seating of side and lock rings by hammering, striking or forcing the components.

- Note:**
- Employees should stay out of the trajectory as much as possible while installing the split rim wheel onto the vehicle.
  - The trajectory may deviate from its expected path.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-40020, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-500** Service single-piece rim wheels safely. **Your responsibility:**

To establish and use procedures to service single-piece rim wheels safely.

**You must:**

Establish a safe operating procedure for single-piece rim wheels

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WAC 296-864-50005.

Follow these procedures for demounting single-piece rim wheels

WAC 296-864-50010.

Follow these procedures when working on single-piece rim wheel components

WAC 296-864-50015.

Follow these procedures for inflating single-piece rim wheels

WAC 296-864-50020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-500, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-50005** Establish a safe operating procedure for single-piece rim wheels.

**You must:**

- Establish a safe operating procedure for servicing single-piece rim wheels that includes the procedures in WAC 296-864-50010 through 296-864-50020.
- Instruct employees in that procedure.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-50005, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-50010** Follow these procedures for demounting single-piece rim wheels.

**You must:**

- Follow the relevant procedures in Table 4, Procedures for Demounting Single-Piece Wheel Components.

**Table 4**  
**Procedures for Demounting Single-Piece Rim Wheels**

During these times	Then
At all times.	Make sure mounting and demounting of the tire is done only from the narrow ledge side of the wheel.
When demounting rim wheels.	Make sure tires are completely deflated before demounting by removal of the valve core.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-50010, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-50015** Follow these procedures when working on single-piece rim wheels and components.

**You must:**

- Follow the relevant procedures in Table 5, Procedures for Working on Single-Piece Wheel Components.

**Table 5**  
**Procedures for Working on Single-Piece Rim Wheel Components**

During these times	Then
At all times.	Avoid damaging the tire beads while mounting tires on wheels.
At all times.	Make sure tires are mounted only on compatible wheels of matching bead diameter and width.

[Title 296 WAC—p. 3053]

**Table 5**  
**Procedures for Working on Single-Piece Rim Wheel Components**

Before assembly of the rim wheel.	Apply rubber lubricant to bead and wheel mating surfaces, unless the tire or wheel manufacturer recommends against the use of any rubber lubricant.
When using a tire changing machine.	Make sure the tire is inflated only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.
When using a bead expander.	Make sure it is removed:  – Before the valve core is installed; <b>AND</b> – As soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).

**Note:** You should not inflate tires above 40 psi to seat the bead.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-50015, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-50020 Follow these procedures for inflating single-piece rim wheels.**

**You must:**

- Inflate tires only when contained within a restraining device or bolted on the vehicle with the lug nuts fully tightened.
- Make sure tires are not inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.
- Make sure employees stay out of the trajectory when inflating a tire.
- Make sure, when inflating tires, that the inflation pressure stamped in the sidewall isn't exceeded unless the manufacturer recommends a higher pressure.
- Make sure tires aren't inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-50020, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-600 Employee training.**

**Your responsibility:**

To train employees to service split rim and single-piece rim wheels.

**You must:**

Train employees who service rim wheels  
WAC 296-864-60005.

Make sure employees demonstrate and retain the ability to service rim wheels safely

WAC 296-864-60010.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-600, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-60005 Train employees who service rim wheels.**

**You must:**

- Train all employees who service rim wheels.
- Make sure that employees do not service any rim wheel until they have been trained and instructed in:
  - Correct procedures of servicing the type of wheel being worked on;

**AND**

– The safe operating procedures described in:

- WAC 296-864-400, Service split rim wheels safely;

**AND**

■ WAC 296-864-500, Service single-piece rim wheels safely.

- Make sure the training program explains the hazards involved in servicing those rim wheels and the safety procedures to be followed.

• Make sure the training program includes, at a minimum, the applicable data from the:

- Charts;
- Rim manuals;

**AND**

– Contents of this standard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-60005, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-60010 Make sure employees demonstrate and retain the ability to service rim wheels safely.**

**You must:**

- Make sure that each employee demonstrates the ability to service rim wheels safely, including performing the following tasks for the specified type of rim wheel in Table 6.

**Table 6**  
**Required Training Tasks**

Required Task	Split Rim	Single-Piece Rim
Demounting and deflation of tires.	X	X
Inspection and identification of the rim wheel components.	X	X
Hazards of mixing 16" and 16.5" tires and rims.		X
Mounting of tires.	X	X
Inflation of tires with a restraining device or other safeguard required by this section.	X	X
Use of the restraining device or barrier, and other equipment required by this section.	X	X
Handling of rim wheels.	X	X
Inflation of the tire when a rim wheel is mounted on a vehicle.		X
The hazards associated with standing in front of a split rim or single-piece rim wheel: – During inflation of the tire; – During inspection of the rim wheel following inflation; <b>AND</b>	X	X

**Table 6  
Required Training Tasks**

Required Task	Split Rim	Single-Piece Rim
– Installation and removal of rim wheels.		

**You must:**

- Make sure any employee that is unable to read the charts or rim manual is effectively trained on their contents.
- Evaluate each employee's ability to perform these tasks and to service rim wheels safely.
- Provide additional training as necessary to make sure that each employee maintains his or her proficiency.

**Helpful tool:**

**Training checklist**

The optional training checklist can help you monitor the training status of your employees. You can find this checklist in the resources section of this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-60010, filed 10/5/04, effective 2/1/05.]

**WAC 296-864-700 Definitions.**

**Barrier** means a fence, wall or other object placed between a single-piece rim wheel and an employee during tire inflation that will contain the components if the air in the tire is suddenly released.

**Charts** means:

- The United States Department of Labor, Occupational Safety and Health Administration publications entitled "*Demounting and Mounting Procedures for Truck/Bus Tires*" and "*Multi-Piece Rim Matching Chart*";
- The National Highway Traffic Safety Administration (NHTSA) publications entitled "*Demounting and Mounting Procedures for Truck/Bus Tires*" and "*Multi-Piece Rim Matching Chart*";

**OR**

- Any other poster that contains at least the same instructions, safety precautions and other information contained in the charts applicable to the types of wheels being serviced.

**Demounting** means deflating and taking apart a tire and rim wheel.

**Installing a rim wheel** means the transfer and attachment of an assembled rim wheel onto a vehicle axle hub.

**Mounting a tire** means the putting together of the wheel and tire components to form a rim wheel, including inflation.

**Restraining device** is a cage or rack that will hold all rim wheel components during an explosive separation of a multipiece rim wheel or during the sudden release of air in a single-piece rim wheel.

**Rim manual** is a publication containing instructions from the manufacturer or other qualified organization for correct mounting, demounting, maintenance, and safety precautions for the type of wheel being serviced.

**Service or servicing** means the mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing, removing, and handling.

**Service area** means any place where an employee services rim wheels.

(2007 Ed.)

**Single-piece rim wheel** means a single part holds the tire, forms part of the air chamber and is the point where the wheel is attached to the vehicle axle.

**Split rim wheel** or **multipiece rim wheel** means a wheel made up of two or more parts. One of the parts is a side ring or locking ring that holds the tire on the wheel when the tire is inflated.

**Trajectory** means the path that a rim wheel component may travel during an explosive separation or the sudden release of air.

**Wheel** means that portion of a rim wheel that attaches to the axle of a vehicle and also contains the inflated tire or tire and tube.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 04-20-079, § 296-864-700, filed 10/5/04, effective 2/1/05.]

**Chapter 296-865 WAC  
MOTOR VEHICLES**

**WAC**

296-865-100	Scope.
296-865-200	All motor vehicles.
296-865-20005	Motor vehicle operation.
296-865-20010	Transportation of passengers.
296-865-20015	Motor vehicle equipment.
296-865-300	Trucks and trailers.
296-865-30005	Truck operation.
296-865-30010	Dump trucks.
296-865-30015	Semitruck brakes.
296-865-30020	Truck and trailer loads.
296-865-400	Definitions.

**WAC 296-865-100 Scope.** This chapter applies to all motor vehicles and semitrucks used on public or private roadways.

**Definition:**

**Motor vehicle** means any vehicle, machine, tractor, trailer, or any combination of these that is driven by mechanical power and used on the roadways in the transportation of people or materials.

This section does not apply to:

- Powered industrial trucks (forklifts) covered by another chapter, Powered industrial trucks, chapter 296-863 WAC;
- Construction equipment covered by another chapter, Safety standards for construction work, chapter 296-155 WAC;
- Logging trucks covered by another chapter, Logging operations, chapter 296-54 WAC;

**AND**

- Agricultural equipment covered by another chapter, Safety standards for agriculture, chapter 296-307 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-100, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-200 All motor vehicles.**

**Your responsibility:**

To make sure all motor vehicle occupants are safe and equipment is safe to use.

- Motor vehicle operation  
WAC 296-865-20005.
- Transportation of passengers  
WAC 296-865-20010.
- Motor vehicle equipment

WAC 296-865-20015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-200, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-20005 Motor vehicle operation.**

**You must:**

- Allow only drivers who are qualified to operate a motor vehicle.
- Allow only drivers who have a current motor vehicle operator's license to operate motor vehicles on public roadways.
- Make sure employees follow any site-specific rules and posted speed limits when operating motor vehicles on roadways privately owned and maintained.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-20005, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-20010 Transportation of passengers.**

**You must:**

- Transport all passengers safely.
- Make sure all employees use seat belts, if the vehicle is equipped with seat belts.

**Exemption:** This does not apply to emergency medical workers during the treatment of a patient in an ambulance.

**You must:**

- Make sure vehicles used to transport employees are, at all times:
    - Well equipped;
    - Covered against the weather;
- AND**
- Maintained in good mechanical condition.
  - Make sure when transporting sharp tools that could present a hazard to employees in the vehicle that you provide compartments or (cargo) screens strong enough to retain the tools.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-20010, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-20015 Motor vehicle equipment.**

**You must:**

- Make sure all equipment operated on public roadways meets all of the state of Washington motor vehicle laws.
- Make sure all parts and accessories are safe to use.
- Make sure all motor vehicle equipment meets the specification or requirements in Table 1.

**Table 1  
Motor Vehicle Equipment**

<b>If you have this type of equipment:</b>	<b>Then make sure the equipment is:</b>
Seats	Properly secured; <b>AND</b> Available for every employee in the vehicle.
Tires	Safe to use.
Exhaust systems	Designed to eliminate the exposure of exhaust gases and fumes; <b>AND</b> Installed and maintained in proper condition.

[Title 296 WAC—p. 3056]

<b>If you have this type of equipment:</b>	<b>Then make sure the equipment is:</b>
Fire extinguishers	Provided when the vehicle is: <ul style="list-style-type: none"> <li>– At least 26,000 pounds (manufacturer's gross weight);</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>– Only used in the state of Washington.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-20015, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-300 Trucks and trailers.**

**Your responsibility:**

To make sure all trucks and trailers are operated and maintained safely.

- Truck operation  
WAC 296-865-30005.
- Dump trucks  
WAC 296-865-30010.
- Semitruck brakes  
WAC 296-865-30015.
- Truck and trailer loads  
WAC 296-865-30020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-300, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-30005 Truck operation.**

**You must:**

- Make sure truck drivers operate equipment at a safe speed at all times for roadway conditions.
  - Make sure truck drivers either:
    - Sound their horn before starting to back and intermittently during the entire backing operation;
- OR**
- Have a working automatic reverse signal alarm that is audible:
    - Above the surrounding noise level;
- AND**
- No less than fifteen feet from the rear of the vehicle.
  - Make sure, during the backing of trucks where vision is obstructed, a signal person is stationed at a point giving a clear view of the rear of the truck and the operator of the truck at all times.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-30005, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-30010 Dump trucks.**

**You must:**

- Make sure dump trucks have a device installed on the frame that will hold the bed in the raised position when employees are working underneath.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-30010, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-30015 Semitruck brakes.**

**You must:**

- Make sure semitrucks are equipped with brakes that will safely hold the maximum load on maximum grades.

**Note:** Trailers may use air brakes or other types of brake equipment approved by the Washington state patrol.

**You must:**

- Test brakes before descending a steep grade.
- Follow the requirements in Table 2, Truck Braking Requirements.

**Table 2  
Semitruck Braking Requirements**

When	You must
You park a truck on an incline	– Turn the wheels into the curb; <b>AND</b> – Have at least one "driver" wheel chocked on each side, independent of the braking system.
Using air brakes	Cut air into the trailer brake system at the time the trailer is attached to the truck.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-30015, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-30020 Truck and trailer loads.**

**You must:**

- Make sure all loads transported on trucks or trailers are:
  - Properly secured and distributed;
- AND**
- Limited to a safe operating load for the:
  - Condition of the roadway;
- AND**
- Capacity of the bridges, trestles, and other structures.

**Note:** The commercial motor vehicles unit of the Washington state patrol determines how much weight can be carried on a vehicle by factoring manufacture limitations, number of axles, and other variables. For more information:

- See RCW 46.44.041, Maximum gross weights—Wheel-base and axle factors; or
- Contact the commercial motor vehicles unit of the Washington state patrol at Trucks@wsp.wa.gov.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-30020, filed 8/10/05, effective 10/1/05.]

**WAC 296-865-400 Definitions. Motor vehicle** means any vehicle, machine, tractor, trailer, or any combination of these that is driven by mechanical power and used on the roadways in the transportation of people or materials.

**Semitruck** means a truck and trailer combination designed and used primarily for carrying material and property.

**Trailer** means a nonmotorized vehicle designed to be towed by a motor vehicle.

**Truck** means any motor vehicle designed, used, or maintained primarily for the transportation of property.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-17-059, § 296-865-400, filed 8/10/05, effective 10/1/05.]

**Chapter 296-869 WAC  
ELEVATING WORK PLATFORMS**

**WAC**

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296-869-60035	Elevating and lowering the platform.
296-869-60040	Working from the platform.
296-869-60045	Malfunctions or unsafe conditions.
296-869-700	Definitions.

**WAC 296-869-100 Scope.** This chapter applies to the following types of elevating work platforms:

- Aerial lifts
- Manually propelled elevating work platforms that have a platform that cannot be positioned completely beyond the base
- Self-propelled elevating work platforms that have a platform that cannot be positioned completely beyond the base
- Boom-supported elevating work platforms that have a boom-supported platform that can be positioned completely beyond the base

**Exemption:** This chapter does not apply to elevating work platforms used:

- By the fire services for fire combat that are covered by Safety standards for fire fighters, chapter 296-305 WAC;

**OR**

- For agriculture activities covered by Safety standards for agriculture, chapter 296-307 WAC

**Definitions:**

- Aerial lift:
    - An aerial device mounted on a vehicle such as a truck, trailer, or all-terrain vehicle.
  - Aerial device:
    - A vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.
  - Elevating work platform:
    - A device used to position personnel, along with their necessary tools and materials, at work locations. It includes a platform and an elevating assembly and may be either:
      - Vehicle mounted;
- OR**
- Have an integral chassis providing mobility and a means of support
  - Platform:

– The portion of an elevating work platform intended to be occupied by personnel. It may also be called a basket, bucket, stand, or similar term.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-100, filed 9/19/06, effective 1/1/07.]

### **WAC 296-869-200 Section contents.**

#### **IMPORTANT:**

This section applies to the following types of vehicle-mounted aerial devices:

- Extensible-boom work platforms
- Articulating-boom work platforms
- Vertical towers
- Aerial ladders
- A combination of any of the above types of elevating work platforms

#### **Your responsibility:**

To meet these requirements when using aerial lifts.

WAC 296-869-20005

Design and construction

WAC 296-869-20010

Modifications

WAC 296-869-20015

Owned, rented, or leased aerial lifts

WAC 296-869-20020

Operator requirements

WAC 296-869-20025

Operator training

WAC 296-869-20030

Operator prestart inspection

WAC 296-869-20035

Workplace survey

WAC 296-869-20040

Before and during use

WAC 296-869-20045

Working from the platform

WAC 296-869-20050

Moving the aerial lift

WAC 296-869-20055

Aerial ladders

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-200, filed 9/19/06, effective 1/1/07.]

### **WAC 296-869-20005 Design and construction.**

#### **You must:**

• Make sure aerial lifts manufactured on or after July 1, 2006, meet the design and construction requirements of ANSI A92.2-2001, American National Standard for Vehicle-Mounted Elevating and Rotating Aerial Devices.

• Make sure aerial lifts manufactured before July 1, 2006, meet the design and construction requirements of ANSI A92.2-1969, American National Standard for Vehicle-Mounted Elevating and Rotating Work Platforms.

#### **Definition:**

- Aerial lift:
  - An aerial device mounted on a vehicle such as a truck, trailer, or all-terrain vehicle.
- Aerial device:
  - A vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.

[Title 296 WAC—p. 3058]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20005, filed 9/19/06, effective 1/1/07.]

### **WAC 296-869-20010 Modifications.**

#### **You must:**

• Have written approval from the manufacturer before making any modification or addition that affects the safe operation, stability, intended use, or the mechanical, hydraulic, or electrical integrity of the aerial lift. Make sure the modified aerial lift is:

– At least as safe as it was before being modified;

#### **AND**

– Any change to the insulated portion of the aerial lift does not reduce the insulating value

**Note:** If the original manufacturer is no longer in business, an equivalent entity such as a nationally recognized testing laboratory may approve modification.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20010, filed 9/19/06, effective 1/1/07.]

### **WAC 296-869-20015 Owned, rented, or leased aerial lifts.**

#### **IMPORTANT:**

This section applies if you own, rent, or lease an aerial lift.

#### **You must:**

• Meet the requirements of the Responsibilities of Owners, section 8, of ANSI A92.2-2001, American National Standard for Vehicle-Mounted Elevating and Rotating Aerial Devices, if you own an aerial lift.

• Meet the requirements of the Responsibilities of Renters, Lessors or Lessees, section 11, of ANSI A92.2-2001, American National Standard for Vehicle-Mounted Elevating and Rotating Aerial Devices, if you rent or lease an aerial lift.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20015, filed 9/19/06, effective 1/1/07.]

### **WAC 296-869-20020 Operator requirements.**

#### **You must:**

• Permit only trained and authorized personnel to operate aerial lifts.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20020, filed 9/19/06, effective 1/1/07.]

### **WAC 296-869-20025 Operator training.**

#### **You must:**

• Make sure personnel are trained before they are permitted to operate an aerial lift. Cover at least the following items:
 

- General instruction on the inspection, application, and operation of aerial lifts

■ Include recognizing and avoiding hazards associated with their operation

– Purpose and use of manuals

■ Include proper storage of the manuals on the vehicle when not in use

– Prestart inspection

– Responsibilities associated with problems or malfunctions affecting the operation of the aerial lift

– Factors affecting stability

– Purpose of placards and decals

– Workplace survey

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- Safety rules and regulations pertinent to the industry
- Authorization to operate an aerial lift
- Operator warnings and instructions
- Proper use of personal fall protection equipment
  - Have operator trainees actually operate the aerial lift, under the direction of a qualified person, for enough time to demonstrate proficiency.
    - Retrain an operator if evaluation and observation of the operator indicates retraining is necessary.
    - Instruct operators in all of the following before they are directed to operate an aerial lift with which they are not familiar:
      - Location of the manuals.
      - Purpose and function of all controls.
      - Safety devices and operating characteristics specific to the aerial lift

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20025, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-20030 Operator prestart inspection.**

**You must:**

- Make sure the operator does a prestart inspection of the aerial device as shown in Table 1, Operator Prestart Inspection.
  - Have a qualified person examine or test any items found during the inspection that are thought to be unsafe to determine if they constitute a safety hazard.
  - Replace or repair all unsafe items before use.

**Table 1  
Operator Prestart Inspection**

<b>Component or system:</b>	<b>Test or inspect for the following:</b>
Operating controls and associated mechanisms	Conditions interfering with proper operation
Visual and audible safety devices	Malfunctions
Hydraulic or pneumatic systems	Visible deterioration or excessive leaks
Fiberglass and other insulating components	Visible damage or contamination
Operational and instructional markings	That they are present and legible
Electrical systems of or related to the aerial device	Malfunction and for signs of excessive deterioration, dirt, and moisture accumulation
Locking devices, bolts, pins, and other fasteners	That they are in-place and not loose or deformed

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20030, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-20035 Workplace survey.**

**You must:**

- Have the operator survey the area, before using an aerial lift, for hazards such as:
  - Untamped earth fills
  - Ditches
  - Drop-offs and floor obstructions
  - Debris
  - Overhead obstructions and electrical conductors
  - Weather conditions

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- Unauthorized persons in the area

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20035, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-20040 Before and during use.**

**You must:**

- Set the brakes and make sure outriggers, when used, are positioned on pads or a solid surface.
  - Install wheel chocks when using the aerial lift on an incline if they can be installed safely.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20040, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-20045 Working from the platform.**

**You must:**

- Make sure boom and platform load limits specified by the manufacturer are not exceeded.
  - Make sure persons stand firmly on the floor of the platform and do not:
    - Sit or climb on the edge of the platform;
- OR**
- Use guardrails, planks, ladders, or any other device to gain additional height or reach
  - Prohibit wearing climbers when working from the platform.
  - Make sure all persons on the platform wear a full body harness with a lanyard attached to either:
    - The manufacturer's recommended attachment point;

**OR**

- The boom or platform if the manufacturer does not specify an attachment point
  - Never attach a lanyard to an adjacent pole, structure, or equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20045, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-20050 Moving the aerial lift.**

**You must:**

- Make sure the boom is properly cradled and the outriggers are in the stowed position before moving the aerial lift.

**Exemption:** The aerial lift may be moved with the boom elevated and personnel on the platform only if the equipment was specifically designed for this type of operation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20050, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-20055 Aerial ladders.**

**You must:**

- Secure aerial ladders in the lower traveling position, using the locking device or other means provided by the manufacturer, before moving it for highway travel.
    - Make sure all persons working from an aerial ladder wear a full body harness and lanyard attached to either:
      - The manufacturer's recommended attachment point;
- OR**
- The ladder rail if the manufacturer does not specify an attachment point

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-20055, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-300 Section contents.****IMPORTANT:**

This section applies to manually propelled, self-propelled, and boom-supported elevating work platforms.

**Your responsibility:**

To make sure elevating work platforms meet these design, construction, and equipment requirements

WAC 296-869-30005

Manually propelled elevating work platforms

WAC 296-869-30010

Self-propelled elevating work platforms

WAC 296-869-30015

Boom-supported elevating work platforms

WAC 296-869-30020

Modifications

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-300, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-30005 Manually propelled elevating work platforms.****IMPORTANT:**

This section applies to manually propelled, integral chassis, elevating work platforms with a platform that cannot be positioned completely beyond the base.

**You must:**

- Make sure manually propelled elevating work platforms meet the design and construction requirements of American National Standards Institute (ANSI) A92.3-1990, American National Standard for Manually Propelled Elevating Aerial Platforms.

- Make sure the manufacturer provides instructions and markings that meet the requirements of ANSI A92.3-1990, American National Standard for Manually Propelled Elevating Aerial Platforms, on each elevating work platform.

- Make sure manuals that meet the requirements of ANSI A92.3-1990, American National Standard for Manually Propelled Elevating Aerial Platforms, are:

- Provided for each elevating work platform;

**AND**

- Kept in the weather-resistant storage compartment provided by the manufacturer

**Note:** Required manuals include the manufacturer's operating and maintenance manuals and a manual that defines the responsibilities of dealers, owners, lessors, lessees, users, and operators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-30005, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-30010 Self-propelled elevating work platforms.****IMPORTANT:**

This section applies to self-propelled, integral chassis, elevating work platforms with a platform that cannot be positioned completely beyond the base.

**You must:**

- Make sure self-propelled elevating work platforms manufactured on or after July 1, 2006, meet the design and construction requirements of ANSI A92.6-1999, American National Standard for Self-Propelled Elevating Work Platforms.

[Title 296 WAC—p. 3060]

- Make sure self-propelled elevating work platforms manufactured before July 1, 2006 meet the design and construction requirements of ANSI A92.6-1990, American National Standard for Self-Propelled Elevating Work Platforms.

- Make sure the manufacturer provides instructions and markings that meet the requirements of ANSI A92.6-1990 or A92.6-1999, American National Standard for Self-Propelled Elevating Work Platforms, as appropriate, on each elevating work platform.

- Make sure manuals that meet the requirements of ANSI A92.6-1990 or A92.6-1999, American National Standard for Self-Propelled Elevating Work Platforms, as appropriate, are:

- Provided for each elevating work platform;

**AND**

- Kept in the weather-resistant storage compartment provided by the manufacturer

**Note:** Required manuals include the manufacturer's operating and maintenance manuals and a manual that defines the responsibilities of dealers, owners, lessors, lessees, users, and operators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-30010, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-30015 Boom-supported elevating work platforms.****IMPORTANT:**

This section applies to self-propelled, integral chassis, elevating work platforms with a boom-supported platform that can be positioned completely beyond the base.

**You must:**

- Make sure boom-supported elevating work platforms meet the design and construction requirements of American National Standards Institute (ANSI) A92.5-1992, American National Standard for Boom-Supported Elevating Work Platforms.

- Make sure the manufacturer provides instructions and markings that meet the requirements of ANSI A92.5-1992, American National Standard for Boom-Supported Elevating Work Platforms, on each elevating work platform.

- Make sure manuals that meet the requirements of ANSI A92.5-1992, American National Standard for Boom-Supported Elevating Work Platforms, are:

- Provided for each elevating work platform;

**AND**

- Kept in the weather-resistant storage location provided by the manufacturer

**Note:** Required manuals include the manufacturer's operating and maintenance manuals and a manual that defines the responsibilities of dealers, owners, lessors, lessees, users, and operators.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-30015, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-30020 Modifications.****You must:**

- Prohibit altering or disabling interlocks or other safety devices.

- Have written permission from the manufacturer before making any modification to an elevating work platform.

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**Note:** If the original manufacturer is no longer in business, an equivalent entity such as a nationally recognized testing laboratory may approve modification.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-30020, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-400 Section contents.**

**IMPORTANT:**

This section applies to manually propelled, self-propelled, and boom-supported elevating work platforms.

**Your responsibility:**

To inspect, repair, maintain, and service elevating work platforms to keep them in safe operating condition.

WAC 296-869-40005

Condition

WAC 296-869-40010

Inspections

WAC 296-869-40015

Repairs and adjustments

WAC 296-869-40020

Manufacturer's safety bulletins

WAC 296-869-40025

Inspection and repair records

WAC 296-869-40030

Fueling and battery charging

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-400, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-40005 Condition.**

**You must:**

- Inspect and maintain elevating work platforms to keep them in proper operating condition.
- Immediately remove from service any elevating work platform that is not in proper operating condition.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-40005, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-40010 Inspections.**

**You must:**

- Do a prestart inspection of the elevating work platform according to Table 2, Elevating Work Platform Inspections.
- Make sure frequent and annual inspections are done:
  - By a person qualified as a mechanic on the specific make and model of elevating work platform;

**AND**

- According to Table 2, Elevating Work Platform Inspections

**Table 2  
Elevating Work Platform Inspections**

Type of inspection:	When required:	Items to inspect:
Prestart	<ul style="list-style-type: none"> <li>• At the beginning of each shift.</li> </ul>	<ul style="list-style-type: none"> <li>• Do a visual inspection and functional test including at least the following:                             <ul style="list-style-type: none"> <li>– Operating and emergency controls</li> <li>– Safety devices</li> <li>– Personal protective devices, including fall protection</li> <li>– Air, hydraulic and fuel system leaks</li> <li>– Cables and wiring harness</li> <li>– Loose or missing parts</li> <li>– Tires and wheels</li> <li>– Placards, warnings, control markings, and required manuals</li> <li>– Outriggers, stabilizers, and other structures</li> <li>– Guardrail system</li> <li>– Items specified by the manufacturer</li> </ul> </li> </ul>
Frequent	<ul style="list-style-type: none"> <li>• Elevating work platforms that have been in service three months or one hundred fifty hours, whichever comes first;</li> <li><b>AND</b></li> <li>• Before putting elevating work platforms back in service that have been out of service for more than three months</li> </ul> <p><b>Note:</b> Newly purchased used equipment should be given the equivalent of a frequent inspection before being put into service.</p>	<ul style="list-style-type: none"> <li>• All functions and their controls for speeds, smoothness, and limits of motion</li> <li>• Emergency lowering means (manually propelled only)</li> <li>• Lower controls including the provisions for overriding of upper controls (self-propelled and boom-supported)</li> <li>• All chain and cable mechanisms for adjustment and worn or damaged parts</li> <li>• All emergency and safety devices</li> <li>• Lubrication of all moving parts, inspection of filter element(s), hydraulic oil, engine oil, and coolant as specified by the manufacturer</li> </ul>

Type of inspection:	When required:	Items to inspect:
		<ul style="list-style-type: none"> <li>• Visual inspection of structural components and other critical components such as fasteners, pins, shafts, turntable attachment bolts (boom-supported only), and locking devices</li> <li>• Placards, warnings, and control markings</li> <li>• Additional items specified by the manufacturer</li> </ul>
Annual	<ul style="list-style-type: none"> <li>• Not later than thirteen months from the date of the last annual inspection</li> </ul>	<ul style="list-style-type: none"> <li>• All items specified by the manufacturer for an annual inspection</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-40010, filed 9/19/06, effective 1/1/07.]

### WAC 296-869-40015 Repairs and adjustments.

#### You must:

- Make sure repairs to elevating work platforms are:
  - Made by a qualified person;

#### AND

– Done according to the manufacturer's recommendations

• Make sure the elevating work platform, before beginning adjustments or repairs, meets all of the following requirements that apply:

- All controls in the "off" position
- All operating features secured from inadvertent motion by brakes, blocks, or other means
- Powerplant stopped
- Means of starting is rendered inoperative
- Platform either:
  - Lowered to the full down position, if possible;

#### OR

■ Blocked or cribbed to prevent dropping

- Hydraulic pressure relieved from all hydraulic circuits before loosening or removing hydraulic components
- Safety props or latches installed, where applicable
- Other precautions as specified by the manufacturer

• Make sure replacement parts or components are identical or equivalent to the original parts or components.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-40015, filed 9/19/06, effective 1/1/07.]

### WAC 296-869-40020 Manufacturer's safety bulletins.

#### You must:

• Meet the requirements of safety-related bulletins as received from the manufacturer, dealer, or owner.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-40020, filed 9/19/06, effective 1/1/07.]

### WAC 296-869-40025 Inspection and repair records.

#### You must:

• Keep written records documenting:
 

- Frequent and annual inspections you have done including:

- Date of inspection
- Deficiencies found
- Corrective action recommended
- Names of the people who did the inspection;

#### AND

– All repairs done on the elevating work platform, including:

#### ■ Date of repair

#### ■ Description of the work done

#### ■ Names of the people who did the repair

• Retain the records of inspections and repairs for at least:

– Three years for manually propelled and boom-supported elevating work platforms;

#### AND

– Four years for self-propelled elevating work platforms

#### Note:

It is the responsibility of the owner of the elevating work platform to make sure frequent and annual inspections are done and documented. If you perform either type of inspection, or make repairs to the elevating work platform, send the appropriate records to the owner of the elevating work platform.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-40025, filed 9/19/06, effective 1/1/07.]

### WAC 296-869-40030 Fueling and battery charging.

#### You must:

- Shut-down the engine while filling fuel tanks.
- Fill fuel tanks and charge batteries in areas that are:
  - Open and well-ventilated;

#### AND

– Free of flame, sparks, or other hazards that may cause fire or explosion

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-40030, filed 9/19/06, effective 1/1/07.]

### WAC 296-869-500 Section contents.

#### IMPORTANT:

This section applies to manually propelled, self-propelled, and boom-supported elevating work platforms.

#### Your responsibility:

To properly train elevating work platform operators

WAC 296-869-50005

Operator authorization and training

WAC 296-869-50010

Specific model training

WAC 296-869-50015

Operator training records

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-500, filed 9/19/06, effective 1/1/07.]

### WAC 296-869-50005 Operator authorization and training.

#### You must:

• Permit only trained and authorized personnel to operate elevating work platforms.

- Train operators in all of the following:
  - The manufacturer's operating and maintenance manuals
  - Your work instructions
  - The requirements of this chapter

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-50005, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-869-50010 Specific model training.**

##### **You must:**

- Make sure operators:
  - Know the required manuals supplied by the manufacturer are stored in a weather resistant compartment and where the compartment is located;

##### **AND**

- Refer to the manuals when necessary
- Make sure operators do all of the following before operating an elevating work platform:

- Read and understand the manufacturer's operating instructions and your safety rules, or have them explained by a qualified person

- Understand, by reading or by having a qualified person explain, all decals, warnings, and instructions displayed on the elevating work platform

- Are instructed by a qualified person in the intended purpose and function of each control

- Have operator trainees demonstrate their knowledge and proficiency during actual operation of an elevating work platform under the following conditions:

- Under the direction of a qualified person

- In an area free of obstructions

- Using an elevating work platform that is:

- **■** The same model that they will be operating;

##### **OR**

- **■** One that has similar controls and operating characteristics

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-50010, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-869-50015 Operator training records.**

##### **You must:**

- Retain records of the operators trained on each model of elevating work platform for at least:
  - Three years for manually propelled and boom-supported elevating work platforms;

##### **AND**

- Four years for self-propelled elevating work platforms

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-50015, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-869-600 Section contents.**

##### **IMPORTANT:**

This section applies to manually propelled, self-propelled, and boom-supported elevating work platforms.

##### **Your responsibility:**

To meet these requirements when operating elevating work platforms

WAC 296-869-60005

Intended use

WAC 296-869-60010

(2007 Ed.)

Workplace survey

WAC 296-869-60015

Hazardous locations

WAC 296-869-60020

Set up

WAC 296-869-60025

Travel speed

WAC 296-869-60030

Driving

WAC 296-869-60035

Elevating and lowering the platform

WAC 296-869-60040

Working from the platform

WAC 296-869-60045

Malfunctions or unsafe conditions

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-600, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-869-60005 Intended use.**

##### **You must:**

- Make sure elevating work platforms are used only for their intended purpose as specified by the manufacturer.

**Note:** Misuse of an elevating work platform includes, but is not limited to:

- Using the elevating work platform as a crane
- Using the platform to jack the wheels off the ground unless the machine was designed for that purpose by the manufacturer
- Operating the elevating work platform from a truck, trailer, railway car, floating vessel, scaffold, or similar equipment unless the application is approved in writing by the manufacturer

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60005, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-869-60010 Workplace survey.**

##### **You must:**

- Have the operator survey the area before and during use of an elevating work platform for hazards such as:

- Drop-offs or holes

- Slopes

- Bumps and floor obstructions

- Debris

- Overhead obstructions and high voltage conductors

- Hazardous locations

- Inadequate surface and support to withstand the load imposed on them by the elevating work platform in all operating configurations

- Wind and weather conditions

- Unauthorized persons in the area

- Other possible unsafe conditions

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60010, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-869-60015 Hazardous locations.**

##### **You must:**

- Determine the hazard classification of any area where the elevating work platform will operate using National Fire Protection Association (NFPA) 505-2002, Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations.

[Title 296 WAC—p. 3063]

- Make sure only approved elevating work platforms are used in Class I, II, or III locations.
  - Make sure elevating work platforms are used in hazardous (classified) locations as follows:
    - Elevating work platforms authorized to be used in Class 1 locations are shown in Table 3, Approved Elevating Work Platform Use in Class 1 Locations
    - Elevating work platforms authorized to be used in Class 2 locations are shown in Table 4, Approved Elevating Work Platform Use in Class 2 Locations
    - Elevating work platforms authorized to be used in Class 3 locations are shown in Table 5, Approved Elevating Work Platform Use in Class 3 Locations
  - Elevating work platforms authorized to be used in unclassified locations are:
    - Approved elevating work platforms designated as Type D, E, G, or LP;
- AND**
- Elevating work platforms that meet the requirements of Type D, E, G, or LP elevating work platforms.
  - Have operators report any hazardous atmosphere or location that becomes apparent while operating the elevating work platform.

**Definitions:**

- An **unclassified location** is an area that's not designated as a Class 1, 2, or 3 location.
- The **type designation** is a code to identify types of elevating work platforms. It is used to determine if an elevating work platform can be used in a specific classified or unclassified location.
  - **D** refers to elevating work platforms that are diesel engine powered that have minimum safeguards against inherent fire hazards.
  - **DS** refers to diesel powered elevating work platforms that, in addition to meeting all the requirements for type D elevating work platforms, are provided with additional safeguards to the exhaust, fuel and electrical systems.

- **DY** refers to diesel powered elevating work platforms that have all the safeguards of the DS elevating work platforms and, in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.
  - **E** refers to electrically powered elevating work platforms that have minimum acceptable safeguards against inherent fire hazards.
  - **ES** refers to electrically powered elevating work platforms that, in addition to all of the requirements for the E elevating work platforms, have additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.
  - **EE** refers to electrically powered elevating work platforms that, in addition to all of the requirements for the E and ES type elevating work platforms, have their electric motors and all other electrical equipment completely enclosed.
  - **EX** refers to electrically powered elevating work platforms that differ from E, ES, or EE type elevating work platforms in that the electrical fittings and equipment are designed, constructed and assembled to be used in atmospheres containing flammable vapors or dusts.
  - **G** refers to gasoline powered elevating work platforms that have minimum acceptable safeguards against inherent fire hazards.
    - **GS** refers to gasoline powered elevating work platforms that are provided with additional exhaust, fuel, and electrical systems safeguards.
    - **LP** refers to liquefied petroleum gas-powered elevating work platforms that, in addition to meeting all the requirements for type G elevating work platforms, have minimum acceptable safeguards against inherent fire hazards.
    - **LPS** refers to liquefied petroleum gas-powered elevating work platforms that in addition to meeting the requirements for LP type elevating work platforms, have additional exhaust, fuel, and electrical systems safeguards.

**Table 3**  
**Approved Elevating Work Platform Use in Class 1 Locations**

<b>Class 1</b>							
Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures							
<b>Division 1</b>				<b>Division 2</b>			
Conditions exist continuously, intermittently, or periodically under normal operating conditions.				Conditions may occur accidentally, for example, due to a puncture of a storage drum.			
<b>Group A</b>	<b>Group B</b>	<b>Group C</b>	<b>Group D</b>	<b>Group A</b>	<b>Group B</b>	<b>Group C</b>	<b>Group D</b>
Acetylene	Hydrogen	Ethyl ether	Acetone Alcohols Benzene Gasoline Lacquer Solvent	Acetylene	Hydrogen	Ethyl ether	Acetone Alcohols Benzene Gasoline Lacquer Solvent
No type can be used	No type can be used	No type can be used	Use this elevating work platform type: <b>EX</b>	No type can be used	No type can be used	No type can be used	Use this elevating work platform type: <b>DS</b> <b>DY</b> <b>ES</b> <b>EE</b>

<b>Class 1</b>							
Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures							
<b>Division 1</b>				<b>Division 2</b>			
Conditions exist continuously, intermittently, or periodically under normal operating conditions.				Conditions may occur accidentally, for example, due to a puncture of a storage drum.			
							<b>EX</b> <b>GS</b> <b>LPS</b>

**Table 4**  
**Approved Elevating Work Platform Use in Class 2 Locations**

<b>Class 2</b>					
Locations which are hazardous because of the presence of combustible dust					
<b>Division 1</b>			<b>Division 2</b>		
Explosive mixture may be present under normal operating conditions, or where failure of equipment may cause the condition to exist simultaneously with arcing or sparking of electrical equipment, or where dusts of an electrically conducting nature may be present.			Explosive mixture not normally present, but where deposits of dust may cause heat rise in electrical equipment, or where such deposits may be ignited by arcs or sparks from electrical equipment.		
<b>Group E</b>	<b>Group F</b>	<b>Group G</b>	<b>Group E</b>	<b>Group F</b>	<b>Group G</b>
Metal dust	Carbon black Coal dust Coke dust	Grain dust Flour dust Starch dust Organic dust	Metal dust	Carbon black Coal dust Coke dust	Grain dust Flour dust Starch dust Organic dust
<b>No type can be used</b>	<b>Use this elevating work platform type:</b>  <b>EX</b>	<b>Use this elevating work platform type:</b>  <b>EX</b>	<b>No type can be used</b>	<b>No type can be used</b>	<b>Use this elevating work platform type:</b>  <b>DS</b> <b>DY</b> <b>ES</b> <b>EE</b> <b>EX</b> <b>GS</b> <b>LPS</b>

**Table 5**  
**Approved Elevating Work Platform Use in Class 3 Locations**

<b>Class 3</b>	
Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures	
<b>Division 1</b>	<b>Division 2</b>
Locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Locations in which easily ignitable fibers are stored or handled (except in the process of manufacture).
<b>Use this elevating work platform type:</b> <b>DY</b> <b>EE</b> <b>EX</b>	<b>Use this elevating work platform type:</b> <b>DS</b> <b>DY</b> <b>E</b> <b>ES</b> <b>EE</b> <b>EX</b> <b>GS</b> <b>LPS</b>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60015, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-60020 Set up.**

**You must:**

- Prohibit positioning the elevating work platform against another object in order to steady the platform.
- Do the following when other moving equipment or vehicles are present:
  - Take special precautions to meet the requirements of local ordinances or workplace safety standards;

**AND**

- Use warnings such as, but not limited to, flags, roped-off areas, flashing lights and barricades

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60020, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-60025 Travel speed.** Make sure the operator limits travel speed according to conditions, including:

- Condition of the ground or support surface;
- Congestion;
- Visibility;
- Slope;
- Location of personnel;
- Other factors that may create a hazard of collision or injury to personnel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60025, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-60030 Driving.**

**IMPORTANT:**

This section does not apply to manually propelled elevating work platforms.

**You must:**

- Make sure the operator does all of the following before and while driving with the platform elevated:
  - Maintains a clear view of the path of travel
  - Keeps a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to safe travel
  - Keeps a safe distance from overhead obstacles
- Prohibit stunt driving and horseplay.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60030, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-60035 Elevating and lowering the platform.**

**You must:**

- Have the operator make sure all of the following are done before each elevation of the platform:
  - The elevating work platform is on a surface that is within the limits specified by the manufacturer
  - Outriggers, stabilizers, extendable axes, or other stabilizing enhancing means are used as required by the manufacturer
  - Guardrails are installed and access gates or openings are closed per the manufacturer's instructions
  - The load and its distribution on the platform and any platform extension does not exceed the manufacturer's rated capacity for the configuration being used
  - There is adequate clearance from overhead obstructions
  - The minimum safe approach distance (MSAD) to energized power lines and parts listed in Table 6, Minimum Safe Approach Distance, is maintained
  - All persons on the platform are wearing fall protection devices and other safety gear if required
- Prevent rope, electric cords, hoses and similar objects from becoming entangled with the platform.
- Have the operator make sure the area is clear of personnel and equipment before lowering the platform.
- Remove all personnel from a platform that has been caught, snagged, or otherwise prevented from normal motion before attempting to free it using ground controls.

**Note:** If possible, reverse the platform controls to free a platform that is caught, snagged, or otherwise prevented from normal motion by an adjacent structure or other obstacle.

**Table 6  
Minimum Safe Approach Distance**

<b>Voltage</b>	<b>Minimum Safe Approach Distance</b>
Less than 300 volts (insulated lines)	3 feet (0.9 m)
Less than 300 volts (uninsulated lines)	10 feet (3.1 m)
300 volts to 50 kv	10 feet (3.1 m)
More than 50 kv	10 feet (3.1 m) + 0.4 inches (1.0 cm) for each 1 kv over 50 kv

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60035, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-60040 Working from the platform.**

**You must:**

- Make sure persons working from the platform:
  - Keep a firm footing on the platform;

**AND**

- Do not use guardrails, planks, ladders, or any other device to gain additional height or reach
  - Make sure all persons on the platform of boom-supported elevating work platforms wear a full body harness and lanyard fixed to manufacturer provided and approved attachment points.
  - Make sure the rated capacities of the platform are not exceeded when transferring loads to the platform at any height.

**Note:** Guardrails are the primary means of fall protection for manually propelled elevating work platforms.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60040, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-60045 Malfunctions or unsafe conditions.**

**You must:**

- Make sure operators, if they suspect a malfunction of the elevating work platform or encounter any hazard or potentially unsafe condition, do all of the following:
  - Cease operation
  - Report the problem or malfunction
  - Discontinue using the elevating work platform until problems or malfunctions that affect safe operation have been corrected

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-60045, filed 9/19/06, effective 1/1/07.]

**WAC 296-869-700 Definitions.**

**Aerial device:**

A vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.

**Aerial ladder:**

A vehicle-mounted elevating work platform consisting of a single or multiple-section extensible ladder. It may or may not have a platform at the top.

**Aerial lift:**

An aerial device mounted on a vehicle such as a truck, trailer, or all-terrain vehicle.

**Approved:**

Listed or approved by a nationally recognized testing laboratory or a federal agency that issues approvals for equipment such as the Mine Safety and Health Administration (MSHA); the National Institute for Occupational Safety and Health (NIOSH); Department of Transportation; or U.S. Coast Guard, which issue approvals for such equipment.

**Articulating-boom work platform:**

A vehicle-mounted elevated work platform with two or more hinged boom sections.

**Boom-supported elevating work platform:**

A self-propelled, integral chassis, elevating work platform with a boom-supported platform that can be positioned completely beyond the base.

**Chassis:**

The part of a nonvehicle-mounted elevating work platform that provides mobility and support for the elevating assembly and platform.

**Elevating work platform:**

A device used to position personnel, along with their necessary tools and materials, at work locations. It includes a platform and an elevating assembly. It may be vehicle mounted or have an integral chassis for mobility and as a means of support.

**Extensible-boom work platform:**

A vehicle-mounted elevating work platform with a telescopic or extensible boom.

**Manually propelled elevating work platform:**

A manually propelled, integral chassis, elevating work platform with a platform that cannot be positioned completely beyond the base.

**Platform:**

The portion of an elevating work platform intended to be occupied by personnel. It may also be called a basket, bucket, stand, or similar term.

**Rated capacity:**

The designed carrying capacity of the elevating work platform as specified by the manufacturer.

**Self-propelled elevating work platform:**

A self-propelled, integral chassis, elevating work platform with a platform that cannot be positioned completely beyond the base.

**Type designation:**

A code to identify types of elevating work platforms. It is used to determine if an elevating work platform can be used in a specific classified or unclassified location.

– **D** refers to elevating work platforms that are diesel engine powered that have minimum safeguards against inherent fire hazards.

– **DS** refers to diesel powered elevating work platforms that, in addition to meeting all the requirements for type D elevating work platforms, are provided with additional safeguards to the exhaust, fuel and electrical systems.

– **DY** refers to diesel powered elevating work platforms that have all the safeguards of the DS elevating work platforms and, in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.

– **E** refers to electrically powered elevating work platforms that have minimum acceptable safeguards against inherent fire hazards.

– **ES** refers to electrically powered elevating work platforms that, in addition to all of the requirements for the E elevating work platforms, have additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.

– **EE** refers to electrically powered elevating work platforms that, in addition to all of the requirements for the E and ES type elevating work platforms, have their electric motors and all other electrical equipment completely enclosed.

– **EX** refers to electrically powered elevating work platforms that differ from E, ES, or EE type elevating work platforms in that the electrical fittings and equipment are designed, constructed and assembled to be used in atmospheres containing flammable vapors or dusts.

– **G** refers to gasoline powered elevating work platforms that have minimum acceptable safeguards against inherent fire hazards.

– **GS** refers to gasoline powered elevating work platforms that are provided with additional exhaust, fuel, and electrical systems safeguards.

– **LP** refers to liquefied petroleum gas-powered elevating work platforms that, in addition to meeting all the requirements for type G elevating work platforms, have minimum acceptable safeguards against inherent fire hazards.

– **LPS** refers to liquefied petroleum gas-powered elevating work platforms that, in addition to meeting the requirements for LP type elevating work platforms, have additional exhaust, fuel, and electrical systems safeguards.

**Vertical tower:**

A vehicle-mounted elevating work platform having a platform that can be raised along a vertical axis.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-19-073, § 296-869-700, filed 9/19/06, effective 1/1/07.]

**Chapter 296-870 WAC  
POWERED PLATFORMS**

**WAC**

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296-870-70065	Ground-rigged working platforms.
296-870-70070	Intermittently stabilized working platforms.
296-870-70075	Button guide stabilized working platforms.
296-870-70080	Supported equipment.
296-870-70085	Suspension wire ropes and rope connections.
296-870-70090	Control circuits, power circuits and electrical protective devices.
296-870-800	Definitions.

**WAC 296-870-100 Scope.** This chapter covers permanent powered platform installations dedicated to interior or exterior building maintenance of a specific structure or group of structures.

Building maintenance includes, but is not limited to, tasks such as window cleaning, caulking, metal polishing, and reglazing.

**Exemption:** This chapter does not apply to suspended scaffolds covered by a separate chapter, Scaffolds, chapter 296-874 WAC.

**Definition:**

A powered platform **installation** consists of all the equipment and the parts of the building involved with using the powered platform for building maintenance.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-100, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-200 Section contents.**

**Your responsibility:**

To meet these requirements when using powered platforms.

WAC 296-870-20005

Building owner certifications.

WAC 296-870-20010

Personnel requirements.

WAC 296-870-20015

Platform and hoist load limits.

WAC 296-870-20020

Obstructions and slipping hazards.

WAC 296-870-20025

Wind and adverse weather.

WAC 296-870-20030

Corrosive substances.

WAC 296-870-20035

Heat-producing processes.

WAC 296-870-20040

Fall protection.

WAC 296-870-20045

Communications.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-200, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20005 Building owner certifications.**

**You must:**

- Obtain written certification from the building owner of any building with a powered platform installation that was completed or had major modification done after July 23, 1990, that the building and equipment meets the requirements of new installations-buildings, WAC 296-870-600 and new installations-equipment, WAC 296-870-700 of this chapter.

[Title 296 WAC—p. 3068]

**Note:** The building owner needs to base the certification on:

- The field test of the installation done before it is first placed into service or following any major modification to an existing installation;

**AND**

- All other relevant available information, including but not limited to:
  - Test data
  - Equipment specifications
  - Verification by a registered professional engineer.

**You must:**

- Obtain written certification from the building owner that the installation:
  - Has been inspected, tested, and maintained as required by inspection, testing, and maintenance, WAC 296-870-300 of this chapter;

**AND**

- All fall protection anchorages meet the requirements of Appendix C—Personal fall arrest system, WAC 296-24-88050, found in the General safety and health standards, chapter 296-24 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20005, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20010 Personnel requirements.**

**You must:**

- Prohibit employees from using the installation until the building owner has provided the required written certifications.

- Make sure working platforms are operated only by persons proficient in the operation, safe use and inspection of the particular working platform.

**References:**

- Building owner certification requirements are found in Building owner certifications, WAC 296-870-20005.
- Training requirements for persons using platforms are found in Existing installations, WAC 296-870-400.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20010, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20015 Platform and hoist load limits.**

**You must:**

- Make sure the load on the working platform does not exceed the rated load stated on the platform load rating plate.

- Make sure hoists are not subjected to a load greater than one hundred twenty-five percent of their rated load.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20015, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20020 Obstructions and slipping hazards.**

**You must:**

- Prohibit the accumulation of tools, materials and debris on the platform that are not related to the work in progress.

- Make sure stabilizer ties are:
  - Located to allow movement along the full length of the platform without interference;

**AND**

- Long enough not to become entangled in rollers, hoists, or other machinery.

- Prohibit employees from working on platforms covered with snow, ice, or other slippery material.

**Exemption:** Employees may be on platforms as necessary to remove the slipping hazard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20020, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20025 Wind and adverse weather.**

**You must:**

- Prohibit using powered platforms in:
  - Winds exceeding twenty-five miles per hour (40.2

km/hr);

**OR**

- Any other severe adverse weather conditions.

**Exemption:** Employees may use the platform during severe adverse weather conditions only to move it from an operating to a storage position.

**You must:**

- Have an anemometer mounted on the platform of an exterior installation to provide on-site wind velocities before and during use of the platform.

**Note:**

- Determine wind speed using the best available information, including on-site anemometer readings and local weather forecasts.
- The anemometer may be a portable or hand held unit which is temporarily mounted during platform use.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20025, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20030 Corrosive substances.**

**You must:**

- Protect the platform, wire ropes, and lifelines from damage due to acids or other corrosive substances by using the precautions recommended by any of the following:
  - Corrosive substance producer or supplier
  - Platform manufacturer
  - Other equivalent information source.
- Wash down platform members which have been exposed to acids or other corrosive substances with a neutralizing solution as recommended by the corrosive substance producer or supplier.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20030, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20035 Heat-producing processes.**

**You must:**

- Protect the platform members, wire ropes, and lifelines when using a heat-producing process.
- Make sure wire ropes and lifelines which have been contacted by a heat-producing process are considered to be permanently damaged and not used.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20035, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-20040 Fall protection.**

**You must:**

- Protect employees on working platforms with a personal fall arrest system that meets the requirements of Appendix C—Personal fall arrest system, WAC 296-24-88050, found in the General safety and health standards, chapter 296-24 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20040, filed 9/19/06, effective 1/1/07.]

(2007 Ed.)

**WAC 296-870-20045 Communications.**

**You must:**

- Make sure the voice communication system between the equipment operators and persons stationed within the building is operable and manned whenever the platform is being used.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-20045, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-300 Section contents.**

**Your responsibility:**

To make sure powered platforms are inspected, tested, and maintained to keep them in safe operating condition.

**WAC 296-870-30005**

Maintenance.

**WAC 296-870-30010**

Initial installation and after major modification inspection and testing.

**WAC 296-870-30015**

Before use inspections and tests.

**WAC 296-870-30020**

Periodic inspections and tests.

**WAC 296-870-30025**

Reshacking and resocketing wire ropes.

**WAC 296-870-30030**

Disabling safety or electrical protective devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-300, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-30005 Maintenance.**

**You must:**

- Make sure all parts of the equipment that affect safe operation are maintained in proper working order so they are able to perform their intended functions. This includes, but is not limited to, all of the following:
  - Roof systems including roof track systems, tie-downs, or similar equipment
  - Building face guiding members including T-rails, indented mullions, or equivalent guides located in the face of a building
  - Brackets for cable stabilizers.

• Take out of service any equipment that is not in proper working order.

- Make sure the following parts are kept clean:

- Control or power contacts and relays;

**AND**

- All other parts whose proper function would be affected by dirt or other contaminants.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-30005, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-30010 Initial installation and after major modification inspection and testing.**

**You must:**

• Make sure a completed powered platform installation has been inspected and tested by the building owner:

- Before it was first placed into service;

**AND**

– Before it was returned to service after major modification was done.

- Make sure the inspection and tests determined that:

– All parts of the installation met the applicable requirements of this chapter;

**AND**

– All safety and operating equipment functioned as required.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-30010, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-30015 Before use inspections and tests.**

**You must:**

• Complete the inspections and tests contained in Table 1, Before Use Inspections and Tests, before allowing persons to use the platform.

**Table 1  
Before Use Inspections and Tests**

<b>What:</b>	<b>When:</b>	<b>Inspection and test requirements:</b>
Working platforms and their components	<ul style="list-style-type: none"> <li>• Before every use</li> <li><b>and</b></li> <li>• After each occurrence which might affect the platform's structural integrity</li> </ul>	Inspect for visible defects
Suspension wire ropes	<ul style="list-style-type: none"> <li>• Before every use</li> <li><b>and</b></li> <li>• After each occurrence which might affect the wire rope's integrity</li> </ul>	Visible inspection by a competent person for defects and gross damage
Governors and secondary brakes	Before use each day	Test before use. If testing is not feasible, visually inspect the brake to make sure it is free to operate
Hoists	Each day before lowering personnel below the top elevation of the building	Test in the lifting direction with the intended load to make sure it has sufficient capacity to raise personnel back to the boarding level

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-30015, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-30020 Periodic inspections and tests.**

**You must:**

• Make sure the building owner has completed and documented the periodic inspections and tests shown in Table 2.  
 • Make sure any documentation required by Table 2, Periodic Inspections and Tests, is readily available for your

own review and that of the director or an authorized representative.

• Make sure suspension wire rope is used and maintained as specified in the wire rope manufacturer's recommended procedures.

• Remove from service a wire rope that has any of the following:

– Broken wires exceeding three wires in one strand or six wires in one rope lay

– Distortion of rope structure such as would result from crushing or kinking

– Evidence of heat damage

– Evidence of rope deterioration from corrosion

– A broken wire within eighteen inches (460.8 mm) of the end attachments

– Noticeable rusting and pitting

– Evidence of core failure. This could be indicated by a lengthening of rope lay, protrusion of the rope core and a reduction in rope diameter

– More than one valley break (broken wire)

– Outer wire wear exceeds one-third of the original outer wire diameter

– Any other condition which the competent person determines has significantly affected the integrity of the rope.

**Table 2**  
**Periodic Inspections and Tests**

<b>What to inspect:</b>	<b>When to inspect:</b>	<b>Inspection and test requirements:</b>	<b>Building owner documentation:</b>
Related building supporting structures	Intervals not exceeding twelve months	Inspection by a competent person	Keep a certification record of each inspection and test that includes all of the following: <ul style="list-style-type: none"> <li>– Date of the inspection</li> <li>– Signature of the person who performed the inspection</li> <li>– Number, or other identifier, of the building support structure and equipment which was inspected</li> </ul>
All parts of the equipment including control systems	Intervals specified by the manufacturer or supplier, but not to exceed twelve months	Inspection and test, where necessary, by a competent person to determine: <ul style="list-style-type: none"> <li>– They are in safe operating condition</li> <li><b>and</b></li> <li>– Parts subject to wear, such as wire ropes, bearings, gears, and governors have not worn to such an extent as to affect the safe operation of the installation</li> </ul>	
Working platform	<ul style="list-style-type: none"> <li>• Every thirty days</li> <li><b>or</b></li> <li>• Before each work cycle if the work cycle is more than thirty days</li> </ul>	Maintenance inspection and test by a competent person following procedures recommended by the manufacturer	Keep a certification record of each inspection and test that includes all of the following: <ul style="list-style-type: none"> <li>– Date of the inspection and test</li> <li>– Signature of the person who performed the inspection and test</li> <li>– An identifier for the platform installation which was inspected</li> </ul>
Governors and secondary brakes	Intervals specified by the manufacturer or supplier, but not to exceed twelve months	Inspection and test by a competent person. Results need to confirm: <ul style="list-style-type: none"> <li>– The initiating device for the secondary braking system operates at the proper overspeed</li> <li><b>and</b></li> <li>– The secondary brake is functioning properly</li> </ul> If any hoisting machine or initiating device for the secondary brake system is removed from the equipment for testing, reinspect all reinstalled and directly related components before returning the equipment installation to service	

What to inspect:	When to inspect:	Inspection and test requirements:	Building owner documentation:
Suspension wire ropes	<ul style="list-style-type: none"> <li>• Once a month for ropes in service</li> <li><b>and</b></li> <li>• Before they are returned to service for ropes that have been out of service for thirty days or more</li> </ul>	A thorough inspection by a competent person	Keep a certification record of each monthly inspection that includes all of the following: <ul style="list-style-type: none"> <li>– Date of the inspection</li> <li>– Signature of the person who performed the inspection</li> <li>– Number, or other identifier, of the wire rope which was inspected</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-30020, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-30025 Reshacking and resocketing wire ropes.**

#### **You must:**

- Make sure the nondrum ends of hoisting wire ropes are reshacked or, if the rope uses poured socket fastenings, resocketed at intervals not exceeding twenty four months.
- Make sure enough rope is cut from the end of the rope during reshacking or resocketing to remove any damaged or fatigued portions.
- Make sure resocketed ropes meet the requirements of Suspension wire ropes and rope connections, WAC 296-870-70085.
- Make sure limit switches affected by resocketed ropes are reset if necessary.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-30025, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-30030 Disabling safety or electrical protective devices.**

#### **You must:**

- Make sure no person renders any required safety devices or electrical protective devices inoperative unless necessary for tests, inspections, or maintenance.
- Restore any disabled devices to normal operating condition immediately after the test, inspection or maintenance is completed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-30030, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-400 Section contents.**

#### **Your responsibility:**

To train employees who operate or inspect powered platforms.

WAC 296-870-40005

General training.

WAC 296-870-40010

Emergency action plan.

WAC 296-870-40015

Certification.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-400, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-40005 General training.**

#### **You must:**

- Make sure employees are trained by a competent person.

[Title 296 WAC—p. 3072]

- Train employees who operate powered platforms in all of the following:

- Recognizing safety hazards and the preventative measures to control or minimize hazards that are associated with:
  - Using powered platforms, including those that apply to the specific platform they will be operating;

**AND**

- Their individual work tasks.
  - Emergency action plan procedures
  - Work procedures for operating, safely using and inspecting powered platforms.

- Provide written work procedures for operating, safely using, and inspecting working platforms to be used in employee training.

**Note:** Visual presentations, such as graphics and pictures, may be used instead of written work procedures if it improves employee understanding. The powered platform system components manufacturers' operating manuals can serve as the basis for these work procedures.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-40005, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-40010 Emergency action plan.**

#### **You must:**

- Make sure a written emergency action plan is developed and implemented for each kind of working platform operation that contains at least both of the following:

- An explanation of the emergency procedures to be followed in the event of any of the following situations:

- Power failure

- Equipment failure

- Other emergencies which may be encountered.

- That employees are informed about the building emergency escape routes, procedures and alarm systems.

- Review with each employee those parts of the plan they need to know to protect themselves in the event of an emergency:

- Upon initial assignment;

**AND**

- Whenever the plan is changed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-40010, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-40015 Certification.**

#### **You must:**

- Certify in writing that employees have been trained in operating and inspecting a working platform.
- Make sure training certifications are:

- Prepared when the employee has completed training;

AND

- Contain all of the following:
  - Name of the person trained
  - Signature of the person who conducted the training
  - Date training was completed.
  - Make sure the training certification is:
    - Maintained while the employee works for you;

AND

- Kept readily available for review by the director or an authorized representative.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-40015, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-500 Section contents.**

**IMPORTANT:**

This section applies to permanent powered platform installations that meet **all** of the following:

- The installation was completed between August 27, 1971, and July 24, 1990
- There has been no major modification to the installation after July 23, 1990
- The working platforms use electric-powered, winding drum type hoisting machines.

**Note:**

- Platforms operated by other types of power and using other types of hoisting machines are allowed if they:
  - Have adequate protective devices for the type of power used;
- AND
- Provide reasonable safety for persons using or exposed to the equipment
- Other types of hoisting machines include, but are not limited to, machines such as traction drum hoisting machines, air powered machines, hydraulic powered machines, and internal combustion machines.

**Definition:**

An **existing installation** is a permanent powered platform installation that:

- Was completed before July 23, 1990;
- AND
- Has had no major modification done after July 23, 1990.

**Your responsibility:**

To make sure powered platform installations completed between August 27, 1971, and July 24, 1990, meet these building and equipment requirements.

WAC 296-870-50005

Design, construction, and installation.

WAC 296-870-50010

Fall protection.

WAC 296-870-50015

Electrical.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-500, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-50005 Design, construction, and installation.**

**You must:**

- Make sure powered platforms designated as Type F meet all the requirements in Part II of ANSI A120.1-1970, American National Standard Safety Requirements for Powered Platforms for Exterior Building Maintenance.

(2007 Ed.)

**Definition:**

A **Type F powered platform** has both of the following characteristics:

- The working platform is suspended by at least four wire ropes and designed so that failure of any one wire rope will not substantially alter the normal position of the working platform
- Only one layer of hoisting rope is permitted on the winding drums.

**You must:**

- Make sure powered platforms designated as Type T meet all the requirements in Part III of ANSI A120.1-1970 American National Standard Safety Requirements for Powered Platforms for Exterior Building Maintenance except for section 28, Safety belts and lifelines.

**Definition:**

A **Type T powered platform** has a working platform that is suspended by at least two wire ropes. The platform will not fall to the ground if a wire rope fails, but the working platform's normal position would be upset.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-50005, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-50010 Fall protection.**

**You must:**

- Make sure the fall protection system of both Type F and Type T powered platforms meet the requirements of Appendix C—Personal fall arrest system, WAC 296-24-88050, found in the General safety and health standards, chapter 296-24 WAC.
  - Make sure working platforms have permanent guardrails that meet all of the following requirements:
    - Guardrails on the building side (front) of the platform have a top rail that is not less than thirty-eight inches and not more than forty-five inches high.
    - Guardrails on the other three sides have a top rail that is not less than forty-five inches high.
    - Top rails are able to withstand a force of at least two hundred pounds
    - Guardrails have a midrail around the entire platform between the top rail and the toeboard.

**Reference:**

Ramps and walkways that are four feet (1.2 m) or more above a lower level need to have a guardrail system. These requirements are found in Working Surfaces, Guarding Floors and Wall Openings, Ladders, Part J-1, in the General safety and health standards, chapter 296-24 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-50010, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-50015 Electrical.**

**You must:**

- Make sure electrical wiring and equipment meets the requirements of the National Electric Code, NFPA 70-1987, ANSI C1-1987, except as modified by ANSI A120.1-1970 American National Standard Safety Requirements for Powered Platforms for Exterior Building Maintenance.
    - Make sure runway conductor systems are:
      - Designed for use in exterior locations;
- AND
- Located to prevent contact with water or accumulated snow.

[Title 296 WAC—p. 3073]

- Make sure conductors, collectors, and disconnecting means meet the requirements for cranes and hoists in Article 610 of the National Electrical Code, NFPA 70-1987, ANSI C1-1987.

- Make sure the power conductors are paralleled by a grounded conductor that meets both of the following:

- It cannot be opened by the disconnecting means;

**AND**

- The system is designed to not pose a hazard to persons in the area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-50015, filed 9/19/06, effective 1/1/07.]

### WAC 296-870-600 Section contents.

#### IMPORTANT:

This section applies to permanent powered platform installations that meet **either** of the following:

- Were completed after July 23, 1990;

**OR**

- Have had major modifications done to an existing installation after July 23, 1990.

#### Definition:

A **new installation** is a permanent powered platform installation that was completed, or an existing installation that has had major modifications done, after July 23, 1990.

**Note:** If affected parts of the building meet the requirements of the edition of American National Standard Institute/American Society of Mechanical Engineers ANSI/ASME A120.1, Safety Requirements for Powered Platforms for Building Maintenance, that was in effect when the powered platform installation was completed, they will be considered to meet the requirements of this section.

#### Your responsibility:

To make sure new powered platform installations meet these building requirements.

WAC 296-870-60005

Design.

WAC 296-870-60010

Stabilization systems.

WAC 296-870-60015

Intermittent stabilization system.

WAC 296-870-60020

Button guide stabilization system.

WAC 296-870-60025

Stabilization system using angulated roping and building face rollers.

WAC 296-870-60030

Cable stabilization.

WAC 296-870-60035

Electrical.

WAC 296-870-60040

Guarding roofs and other elevated areas.

WAC 296-870-60045

Moving equipment.

WAC 296-870-60050

Repair and maintenance.

WAC 296-870-60055

Communications.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-600, filed 9/19/06, effective 1/1/07.]

### WAC 296-870-60005 Design.

#### You must:

- Make sure structural supports, tie-downs, tie-in guides, anchoring devices and any affected parts of the building included in the installation are designed by, or under the direction of, a registered professional engineer experienced in such design.

- Make sure affected parts of the building are capable of sustaining all the loads imposed by the equipment.

- Make sure exterior installations are capable of withstanding prevailing climatic conditions.

- Make sure the affected parts of the building allow employees to use the equipment without being exposed to a hazardous condition.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60005, filed 9/19/06, effective 1/1/07.]

### WAC 296-870-60010 Stabilization systems.

#### You must:

- Make sure the exterior of each building is provided with at least one of the following stabilization systems:

- Continuous tie-in guides

- Intermittent stabilization system

- Button guide stabilization system

- System using angulated roping and building face rollers

- System equivalent to a continuous tie-in guide system

**Exemption:** Tie-in guides may be eliminated for not more than seventy-five feet (22.9 m) of the uppermost elevation of the building if:

- Using tie-in guides there is not feasible due to building design;

**AND**

- Angulated roping is used that provides a stabilizing force of at least ten pounds (44.4 n) under all conditions of loading.

#### You must:

- Make sure embedded tie-down anchors, fasteners, and affected structures are corrosion-resistant.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60010, filed 9/19/06, effective 1/1/07.]

### WAC 296-870-60015 Intermittent stabilization system.

**Note:** This system may be used with a continuous tie-in guide system on the same building as long as the requirements for each system are met.

#### You must:

- Make sure an intermittent stabilization system:

- Keeps the equipment in constant contact with the building;

**AND**

- Prevents sudden horizontal movement of the platform.

- Make sure building anchors are located vertically so that:

- The distance between anchors is not more than three floors or fifty feet (15.3 m), whichever is less;

**AND**

- Attaching the suspension ropes to the stabilizer ties will not cause the platform to move horizontally across the face of the building.

- Make sure the anchors are positioned horizontally on the building face so as to be symmetrical about the platform suspension ropes.

- Make sure building anchors:
  - Are easily seen by employees;

**AND**

- Allow a stabilizer tie attachment for each of the platform suspension ropes at each vertical interval.

- Make sure building anchors that extend beyond the face of the building have no sharp edges or points.

- Make sure building anchors do not interfere with the handling or operation of cables, suspension wire ropes and lifelines that may be in contact with the building face.

- Make sure the building anchors and components can sustain, without failure, at least four times the maximum anticipated load applied or transmitted to them.

- Make sure the building anchors and stabilizer ties can sustain the anticipated horizontal and vertical loads from winds specified for roof storage design which may act on the platform and wire ropes if the platform is stranded on the building face.

- Make sure the minimum design wind load for each anchor is three hundred pounds (1334 n) if two anchors share the wind load.

- Make sure one building anchor and stabilizer tie can sustain the wind load if either:

- The building anchors have different spacing than the suspension wire rope;

**OR**

- The building requires different suspension spacings on one platform.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60015, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-60020 Button guide stabilization system.**

**You must:**

- Make sure the guide buttons are:
  - Coordinated with the platform guide tracks and other platform-mounted equipment;

**AND**

- Located on the building so they properly engage the guide tracks mounted on the platform.

- Make sure two guide buttons engage each guide track at all times except for the initial engagement.

- Make sure guide buttons that extend beyond the face of the building have no sharp edges or points.

- Make sure guide buttons do not interfere with the handling or operation of cables, suspension wire ropes and lifelines that may be in contact with the building face.

- Make sure guide buttons, connections, and seals are either:

- Able to sustain, without damage, at least the weight of the platform;

**OR**

- Are prevented by the guide tracks or guide track connectors from having the weight of the platform and its attachments transmitted to them.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60020, filed 9/19/06, effective 1/1/07.]

(2007 Ed.)

**WAC 296-870-60025 Stabilization system using angulated roping and building face rollers.**

**You must:**

- Make sure a stabilization system using angulated roping and building face rollers does all of the following:

- Keeps the equipment in continuous contact with the building face

- Prevents sudden horizontal movement of the platform

- Maintains a stabilizing force of at least ten pounds (44.4 n) against the face of the building.

- Make sure the suspended portion of the equipment is not used more than one hundred thirty feet (39.6 m) above a safe surface or ground level.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60025, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-60030 Cable stabilization.**

**You must:**

- Make sure hanging lifelines and all other cables not in tension are stabilized after the initial two hundred feet (61 m) of vertical travel of the working platform and every two hundred feet (61 m) thereafter.

- Make sure hanging cables which are in constant tension, other than suspended wire ropes, are stabilized after an initial six hundred feet (183 m) of vertical travel of the working platform and at intervals of six hundred feet (183 m) or less thereafter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60030, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-60035 Electrical.**

**You must:**

- Make sure, when full load is applied to the equipment power circuit, that the building electrical wiring does not allow more than a five percent voltage drop from the building service vault voltage at any power circuit outlet used by the powered platform installation.

- Make sure the equipment power circuit is provided with a disconnect switch that is all of the following:

- Able to be locked in either the "off" or "on" position

- Conveniently located with respect to the primary operating area of the equipment to allow equipment operators access to the switch

- Locked in the "on" position when the equipment is being used.

- Make sure the powered platform equipment power supply is an independent electrical circuit that remains separate from all other equipment within or on the building.

**Exemption:** The equipment power circuit may be connected to the electrical circuit supplying power to hand tools used in conjunction with the equipment.

**Note:** If the building is provided with an emergency power system, the equipment power circuit may also be connected to the emergency power system.

**Reference:** Unless otherwise specified in this section, building electrical installations have to meet the requirements of Electrical, Part L, in the General safety and health standards, chapter 296-24 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60035, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-60040 Guarding roofs and other elevated areas.****You must:**

- Make sure employees working on a roof or other elevated working area four feet (1.2 m) or more above an adjacent safe surface are protected by a perimeter guarding system.

**Reference:** Requirements for the perimeter guarding system are found in Guarding floor and wall openings and holes, WAC 296-24-750, found in the General safety and health standards, chapter 296-24 WAC.

**You must:**

- Make sure the inboard face of the perimeter guard is:
  - Not more than six inches (152 mm) inboard of the inside face of a barrier such as the parapet wall or roof edge curb;

**AND**

- Not more than eighteen inches (457 mm) from the face of the building.

- Make sure an elevated track system that is designed to be traversed by carriage-supported equipment and located four feet (1.2 m) or more above an adjacent safe surface is either:

- Provided with a walkway and guardrail system;

**OR**

- Has a working platform that can be lowered, as part of normal operations, to the lower safe surface.

- Make sure personnel have a safe way to access and to egress from the lower safe surface.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60040, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-60045 Moving equipment.****You must:**

- Make sure all carriages and carriage-supported equipment can be traversed to a safe area for storage and maintenance.

- Make sure operational areas for trackless type equipment have structural stops, such as curbs, to prevent equipment from traveling outside its intended travel area.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60045, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-60050 Repair and maintenance.****You must:**

- Make sure repair or major maintenance of parts of the building that provide primary support for suspended equipment does not affect the ability of the building to meet the requirements of this chapter.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60050, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-60055 Communications.****You must:**

- Make sure an effective two-way voice communication system is provided between the equipment operators and persons stationed within the building.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-60055, filed 9/19/06, effective 1/1/07.]

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**WAC 296-870-700 Section contents.****IMPORTANT:**

This section applies to permanent powered platform installations that meet either of the following:

- Were completed after July 23, 1990;

**OR**

- Have had major modifications done to an existing installation after July 23, 1990.

**Definition:**

A **new installation** is a permanent powered platform installation that was completed, or an existing installation that has had major modifications done, after July 23, 1990.

**Note:** If the powered platform equipment meets the requirements of the edition of American National Standard Institute/American Society of Mechanical Engineers ANSI/ASME A120.1, Safety Requirements for Powered Platforms for Building Maintenance, that was in effect when the powered platform installation was completed, it will be considered to meet the requirements of this section.

**Your responsibility:**

To make sure equipment used with new powered platform installations meets these requirements.

WAC 296-870-70005

Design and construction.

WAC 296-870-70010

Carriages.

WAC 296-870-70015

Carriage strength and stability.

WAC 296-870-70020

Carriage traversing.

WAC 296-870-70025

Transportable outriggers.

WAC 296-870-70030

Davits.

WAC 296-870-70035

Hoisting machines.

WAC 296-870-70040

Suspended equipment strength and stability.

WAC 296-870-70045

Suspended equipment guardrail system.

WAC 296-870-70050

Suspended working platforms and manned platforms used on supported equipment.

WAC 296-870-70055

Working platform fall protection.

WAC 296-870-70060

Two- and four-point suspended working platforms.

WAC 296-870-70065

Ground-rigged working platforms.

WAC 296-870-70070

Intermittently stabilized working platforms.

WAC 296-870-70075

Button guide stabilized working platforms.

WAC 296-870-70080

Supported equipment.

WAC 296-870-70085

Suspension wire ropes and rope connections.

WAC 296-870-70090

Control circuits, power circuits and electrical protective devices.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-700, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70005 Design and construction.****IMPORTANT:**

This section applies to equipment which is part of a powered platform installation, such as platforms, stabilizing components, carriages, outriggers, davits, hoisting machines, wire ropes and electrical components.

**You must:**

- Make sure equipment installations are designed by, or under the direction of, a registered professional engineer experienced in such design.
- Make sure the design uses a minimum live load of two hundred fifty pounds (113.6 kg) for each occupant of a suspended or supported platform.
- Make sure equipment exposed to wind when not in service is designed to withstand loads generated by winds of at least one hundred miles per hour (44.7 m/s) at thirty feet (9.2 m) above grade.
- Make sure equipment exposed to wind when in service is designed to withstand loads generated by winds of at least fifty miles per hour (22.4 m/s) for all elevations.
- Make sure elevated building maintenance equipment is suspended by one of the following:
  - A carriage
  - Outriggers
  - Davits
  - An equivalent method.
- Make sure bolted connections are self-locking or otherwise secured to prevent loosening by vibration.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70005, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70010 Carriages.****You must:**

- Make sure each carriage work station is identified by location markings or position indicators.
- Make sure means are provided to lock out the power supply for the carriage.
- Make sure safe access to and egress from the carriage is provided from a safe surface.
- Make sure any carriage access gate is either:
  - Self-closing and self-latching;
- OR**
- Provided with an interlock.
- Make sure any operating area on the carriage is protected by a guardrail system.

**Reference:** Guardrail system requirements are found in Suspended equipment guardrail system, WAC 296-870-70045.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70010, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70015 Carriage strength and stability.****You must:**

- Make sure roof carriage system stability is obtained by using gravity, attachment to a structural support, or a combination of gravity and structural attachment.
- Never use a material that can flow as a counterweight to achieve stability.
- Make sure the stability factor against overturning for horizontal traversing of the carriage, including wind and impact effects, is not less than two.

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- Make sure carriages and their anchorages can resist accidental over-tensioning of the wire ropes suspending the platform. Include in the calculation the effect of one and one-half times the stall load of the hoist.

- Make sure all parts of the powered platform installation can withstand, without damage, the forces resulting from a load equal to the stall load of the hoist and one-half of the wind load.

- Make sure roof carriages which develop the required stability against overturning by using tie-down devices secured to the building have an interlock which will prevent vertical platform movement unless the tie-down is engaged.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70015, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70020 Carriage traversing.****You must:**

- Make sure carriages used to suspend powered platforms meet all of the following:
  - The horizontal movement of the carriage is controlled to permit it to be moved safely and to allow accurate positioning of the platform for vertical travel or storage
  - Structural stops and curbs are provided to prevent traversing of the carriage beyond its designed limits of travel
  - Powered carriages are limited to a maximum traversing speed of fifty feet per minute (0.3 m/s)
  - Manually propelled carriages on a smooth level surface require a horizontal force of not more than one hundred pounds (444.8 n) per person to initiate a traversing movement.
- Make sure traversing controls for a powered carriage meet all of the following:
  - Controls are continuous pressure weatherproof type
  - Multiple controls, if provided, only permit operation from one control station at a time
  - An emergency stop device that interrupts power to the carriage drive motors is provided on each end of the carriage.
- Make sure the operating controls of suspended equipment is connected so that traversing the carriage is not possible until:
  - The suspended portion of the equipment is at the uppermost designed position for traversing and free of contact with the face of the building or building guides;

**AND**

- All protective devices and interlocks are in the proper position to allow traversing of the carriage.
- Make sure unintentional traversing of the carriage is prevented by providing one of the following:
  - An automatically applied braking or locking system, or the equivalent, for power-traversed or power-assisted carriages
  - A manual or automatic braking or locking system, or the equivalent, for manually propelled carriages.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70020, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70025 Transportable outriggers.****You must:**

- Make sure transportable outriggers are only used when all of the following are met:

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- They are used with self-powered, ground-rigged working platforms
  - The point of suspension is not higher than three hundred feet (91.5 m) above a safe surface
  - A tie-in guide stabilization system is provided.
- Make sure each outrigger is secured with a tie down to a verified anchorage on the building and meets all of the following:
  - The outrigger is tied down during the entire time it is used
  - The outrigger is tied back with a rope equivalent in strength to the suspension rope
  - The tie-back rope is installed parallel to the centerline of the outrigger
  - The anchorage has a design stability factor against overturning or upsetting of the outrigger of not less than four.
- Make sure access to and egress from the working platform is from and to a safe surface below the point of suspension.
- Make sure each outrigger has a design stability factor to prevent rollover in the event of an accidental lateral load on the outrigger of not less than seventy percent of the rated load of the hoist.
- Make sure each outrigger is designed to support an ultimate load of not less than four times the rated load of the hoist.
- Make sure each outrigger is located so that the suspension wire ropes for two point suspended working platforms are parallel.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70025, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-870-70030 Davits.**

##### **You must:**

- Make sure all davit installations are designed and installed to have a stability factor against overturning of not less than four.
  - Make sure access to and egress from the working platform of roof rigged davit systems:
    - Is from a safe surface;
- AND**
- Does not require persons to climb over a building parapet or guardrail.
  - Make sure the working platform of a roof rigged davit system has wheels, casters, or a carriage for traversing horizontally.
  - Make sure ground rigged davit systems meet all of the following:
    - The point of suspension is not higher than three hundred feet (91.5 m) above a safe surface
    - A tie-in guide stabilization system is provided
    - Access to and egress from the working platform is from a safe surface below the point of suspension.
  - Make sure a rotating davit of a ground rigged davit system requires a horizontal force of forty pounds (177.9 n) or less per person to initiate a rotating movement.
  - Make sure a transportable davit or part of a davit weighing more than eighty pounds (36 kg) has means provided for its transport that keep the center of gravity of the davit at or below thirty-six inches (914 mm) above the safe surface during transport.

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- Make sure a transportable davit is provided with a pivoting socket or base that allows the davit to be removed or inserted:

- At a position of not more than thirty-five degrees above the horizontal;

**AND**

- With the complete davit inboard of the building face.
- Make sure means are provided to lock a transportable davit to its socket or base before it is used to suspend the platform.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70030, filed 9/19/06, effective 1/1/07.]

#### **WAC 296-870-70035 Hoisting machines.**

##### **You must:**

- Make sure suspended or supported equipment is raised or lowered only by a hoisting machine.
  - Make sure each hoisting machine is all of the following:
    - Powered only by air, electric, or hydraulic sources
    - Capable of raising or lowering one hundred twenty-five percent of the rated load of the hoist
    - Able to arrest any overspeed descent of the load.
  - Make sure the stall load of any hoist motor is not more than three times its rated load.
  - Make sure any component of a hoisting machine that needs to be lubricated for protection or proper functioning has means provided to apply the lubricant.
  - Make sure winding drums, traction drums and sheaves, and directional sheaves used in conjunction with hoisting machines are compatible with, and sized for, the wire rope used.
  - Make sure each winding drum:
    - Has a positive means to attach the wire rope to the drum;
- AND**
- The attachment can develop at least four times the rated load of the hoist.
  - Make sure each hoisting machine is provided with a primary brake that is all of the following:
    - Capable of stopping and holding not less than one hundred twenty-five percent of the lifting capacity of the hoist
    - Directly connected to the drive train of the hoisting machine without using belts, chains, clutches, or set screw type devices
    - Automatically set when power to the prime mover is interrupted.
  - Make sure each hoisting machine is provided with at least one independent secondary brake that is all of the following:
    - Capable of stopping and holding not less than one hundred twenty-five percent of the lifting capacity of the hoist
    - An automatic emergency type of brake that, if actuated during each stopping cycle, does not engage before the hoist is stopped by the primary brake
    - Able to stop and hold the platform within a vertical distance of twenty-four inches (609.6 mm) after the brake is actuated.

**Reference:** Moving parts of a hoisting machine need to be enclosed or guarded as required by another chapter, Machine safety, chapter 296-806 WAC.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70035, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70040 Suspended equipment strength and stability.**

**You must:**

- Make sure each suspended unit component is:
  - Capable of supporting, without failure, at least four times the maximum intended live load applied or transmitted to it;

**AND**

- Constructed of materials that will withstand the anticipated weather conditions.

**Exemption:** The strength requirement does not apply to suspension ropes and guardrail systems.

**You must:**

- Make sure each suspended unit has a load rating plate that:

- Is conspicuously located;

**AND**

- States the suspended unit weight and rated load.

- Make sure suspended units that do not have the suspension points at the end of the unit:

- Are continuously stable for any position or use of the live load;

**AND**

- Maintain at least a one and one-half to one stability factor against unit upset.

- Make sure each suspended unit has guide rollers, guide shoes, or building face rollers that compensate for variations in building dimensions and for minor horizontal out-of-level variations of the suspended unit.

- Make sure the working platform of each suspended unit is secured to the building facade by at least one of the following methods:

- Continuous engagement to building anchors
- Intermittent engagement to building anchors
- Button guide engagement
- Angulated roping and building face rollers
- A system equivalent to continuous engagement to building anchors.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70040, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70045 Suspended equipment guardrail system. You must:**

- Make sure each working platform of a suspended unit has a guardrail system on all sides that consists of a top guardrail, midrail, and a toeboard.

- Make sure the top guardrail is:
  - At least thirty-eight inches (950 mm) high;

**AND**

- Able to withstand at least a two hundred pound (890 n) force in any downward or outward direction.

- Make sure the midrail is able to withstand at least a seventy-five pound (333 n) force in any downward or outward direction.

- Make sure material encloses the area:
  - Between the top guardrail and the toeboard on the ends and outboard side of the platform;

**AND**

- Between the midrail and the toeboard on the inboard side of the platform.

- Make sure the material surrounding the platform is:
  - Able to withstand a load of one hundred pounds (45.4 kg) applied horizontally over any area of one square foot (.09 m<sup>2</sup>);

**AND**

- Has openings small enough to not allow passage of life lines and potential falling objects.

- Make sure toeboards are all of the following:
  - Capable of withstanding, without failure, a force of at least fifty pounds (222 n) applied at any point in a downward or horizontal direction

- At least four inches (9 cm) from their top edge to the level of the platform floor

- Securely fastened in place at the outermost edge of the platform

- Installed so there is not more than a one-half inch (1.3 cm) gap between the bottom of the toeboard and the platform floor

- Solid or with openings not more than one inch (2.5 cm) in the greatest dimension.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70045, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70050 Suspended working platforms and manned platforms used on supported equipment.**

**You must:**

- Make sure the width of the working platform is:
  - At least twenty-four inches (610 mm);

**AND**

- Allows a minimum of a twelve-inch (305 mm) wide passage at or past any obstruction on the platform.

- Make sure the platform has slip-resistant flooring.

- Make sure any opening in the platform is either:
  - Small enough to prevent passage of life lines, cables, and other potential falling objects;

**OR**

- Protected by material under the opening which prevents the passage of life lines, cables, and potential falling objects.

- Make sure means are provided to store any cable suspended from above the platform to keep it from accumulating on the floor of the platform.

- Make sure means are provided to secure all tools, water tanks, and other accessories to keep them from moving or accumulating on the floor of the platform.

- Make sure flammable liquids are not carried on the working platform.

- Make sure a type B-C portable fire extinguisher is provided and securely attached on all working platforms.

- Make sure operating controls for vertical travel of the platform are:

- Continuous-pressure type;

**AND**

- Located on the platform.

- Make sure the maximum rated speed of the platform is limited to:

- Fifty feet per minute (0.3 ms) for single speed hoists;

**AND**

– Seventy-five feet per minute (0.4 ms) for multispeed hoists.

- Make sure access to and egress from a working platform, except for those that land directly on a safe surface, is provided by stairs, ladders, platforms or runways.

- Make sure access gates are self-closing and self-latching.

**Reference:** Requirements for stairs, ladders, platforms and runways are found in other chapters:

- Working Surfaces, Guarding Floors and Wall Openings, Ladders, Part J-1 in the General safety and health standards, chapter 296-24 WAC
- Scaffolds, chapter 296-874 WAC
- Ladders, portable, chapter 296-876 WAC.

**You must:**

- Make sure a suspended platform's suspension system restricts the platform inboard to outboard roll around its longitudinal axis to not more than fifteen degrees from the horizontal when moving the live load from the inboard to the outboard side of the platform.

**Note:** The roll limitation does not apply to supported equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70050, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70055 Working platform fall protection.**

**You must:**

- Make sure a secondary wire rope suspension system which prevents the platform from falling if the primary means of support fails is provided on:

- Working platforms that contain overhead structures which restrict emergency egress;

**AND**

- Single-point suspended working platforms.

- Make sure each person on the working platform is provided with a fall arrest system that:

- Meets the requirements of Appendix C—Personal fall arrest system, WAC 296-24-88050, found in the General safety and health standards, chapter 296-24 WAC;

**AND**

- Uses a horizontal lifeline or direct connection anchorage on platforms that contain overhead structures which restrict emergency egress.

- Make sure platforms suspended by two or more wire ropes are provided with vertical lifelines if failure of one wire rope or suspension attachment will cause the platform to upset.

**Note:** Vertical lifelines are not required for the fall arrest system if a secondary wire rope suspension is used and each person is attached to a horizontal lifeline anchored to the platform.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70055, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70060 Two- and four-point suspended working platforms.**

**IMPORTANT:**

In addition to these requirements, you also need to meet the requirements of both of the following sections in this chapter:

- Suspended working platforms and manned platforms used on supported equipment, WAC 296-870-70050

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- Working platform fall protection, WAC 296-870-70055.

**You must:**

- Make sure an emergency electric operating device is provided on roof powered platforms that:

- Can be used if either the normal operating device located on the platform or the cable connected to the platform fails;

**AND**

- Is mounted in a secured compartment near the hoisting machine.

- Make sure the secured compartment containing the emergency electric operating device:

- Is labeled with instructions for using the emergency electric operating device;

**AND**

- Has means for opening the compartment mounted in:

- A break-glass receptacle near the emergency electric operating device;

**OR**

- An equivalent secure and accessible location.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70060, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70065 Ground-rigged working platforms.**

**IMPORTANT:**

In addition to these requirements, you also need to meet the requirements of both of the following sections in this chapter:

- Suspended working platforms and manned platforms used on supported equipment, WAC 296-870-70050

- Working platform fall protection, WAC 296-870-70055.

**You must:**

- Make sure, after each day's use, ground-rigged working platforms are:

- Disconnected from the power supply within the building;

**AND**

- Disengaged from its suspension points or secured and stored at grade.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70065, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70070 Intermittently stabilized working platforms.**

**IMPORTANT:**

In addition to these requirements, you also need to meet the requirements of both of the following sections in this chapter:

- Suspended working platforms and manned platforms used on supported equipment, WAC 296-870-70050;

- Working platform fall protection, WAC 296-870-70055.

**You must:**

- Make sure each stabilizer tie is equipped with a "quick connect - quick disconnect" device for attachment to the building anchor that:

- Cannot be accidentally disengaged;

**AND**

- Is resistant to adverse environmental conditions.
- Make sure the platform has a stopping device that will interrupt the hoist power supply in the event the platform contacts a stabilizer tie during its ascent.

• Make sure intermittently stabilized platforms use stabilizer ties that:

- Allow the specific attachment length needed to obtain the predetermined angulation of the suspended wire rope;

**AND**

- Maintain the specific attachment length at all building anchor locations.

• Make sure stabilizer ties can be attached and removed without horizontal movement of the platform.

• Make sure platform-mounted equipment and suspension wire ropes:

- Will not be damaged by the loads from the stabilizer tie or its building anchor;

**AND**

- Are able to withstand a load that is at least twice the ultimate strength of the stabilizer tie.

• Make sure building face rollers are placed so they do not contact exterior anchors used on the building face.

• Make sure the platform maintains continuous contact with the building face while ascending and descending.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70070, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70075 Button guide stabilized working platforms.**

**IMPORTANT:**

In addition to these requirements, you also need to meet the requirements of both of the following sections in this chapter:

- Suspended working platforms and manned platforms used on supported equipment, WAC 296-870-70050;
- Working platform fall protection, WAC 296-870-70055.

**You must:**

• Make sure two guide tracks are mounted on the platform and provide continuous contact with the building face.

• Make sure each guide track on the platform meets all of the following:

- Engages a minimum of two guide buttons during any vertical travel of the platform after the initial button engagement
- Is sufficiently maneuverable by platform occupants to permit easy engagement of the guide buttons
- Can be easily moved into and out of its storage position on the platform.

• Make sure each guide track on the platform of a roof-rigged system has a storage position on the platform.

• Make sure load carrying components of the button guide stabilization system which transmit the load into the platform are either:

- Able to support the weight of the platform;

**OR**

- Are prevented by the guide track connectors or platform attachments from having the weight of the platform transmitted to the platform attachments.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70075, filed 9/19/06, effective 1/1/07.]

(2007 Ed.)

**WAC 296-870-70080 Supported equipment.**

**IMPORTANT:**

Manned platforms used on supported equipment need to meet all the requirements, except the inboard to outboard roll limitation, of suspended working platforms and manned platforms used on supported equipment, WAC 296-870-60050.

**You must:**

• Make sure supported equipment uses means other than friction to maintain a vertical position relative to the face of the building.

• Make sure cog wheels or equivalent means are incorporated to provide climbing traction between the supported equipment and the building guides.

• Make sure additional guide wheels or shoes are incorporated as necessary to keep the drive wheels continuously in positive engagement with the building guides.

• Make sure that, at the point where the drive wheels enter the building guides, proper alignment is maintained using launch guide mullions that are:

- Indexed to the building guides;

**AND**

- Retained in alignment with the building guides.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70080, filed 9/19/06, effective 1/1/07.]

**WAC 296-870-70085 Suspension wire ropes and rope connections.**

**You must:**

• Make sure each specific installation uses suspension wire ropes and connections or combination cable and connections meeting the specifications recommended by the hoisting machine manufacturer.

• Make sure connections are capable of developing at least eighty percent of the rated breaking strength of the wire rope.

• Make sure each suspension rope has a design factor of at least ten.

**Definition:**

The design factor is the ratio of the rated strength of the suspension wire rope to the rated working load. It is calculated using the following formula:

$$F = (S \times N)/W$$

Where:

F = Design factor

S = Manufacturer's rated strength of one suspension rope

N = Number of suspension ropes under load

W = Rated working load on all ropes at any point of travel.

**Example:**

A working platform is suspended by 4 wire ropes (N), each having a rated strength (S) of three thousand pounds. The rated working load of the platform (W) is one thousand pounds.

Calculate the design factor (F) as follows:

$$F = (S \times N)/W = (3000 \times 4)/1000 = 12000/1000 = 12$$

**You must:**

• Make sure the minimum grade of suspension wire rope used is improved plow steel or equivalent.

• Make sure suspension wire ropes are sized to conform with the required design factor, but never less than 5/16 inch (7.94 mm) in diameter.

- Make sure there is not more than one reverse bend in six wire rope lays.

- Make sure a suspension wire rope that is to be used at a specific location, and will remain at that location, has a corrosion-resistant tag that:

- Is securely attached to one of the wire rope fastenings;

**AND**

- Bears the following wire rope information:

- Diameter in inches or millimeters (mm)

- Construction classification

- Whether nonpreformed or preformed

- Grade of material

- Manufacturer's rated strength

- Manufacturer's name

- Month and year the ropes were installed

- Name of the person or company which installed the ropes.

- Make sure a new tag is installed at each wire rope renewal.

- Make sure when resocketing the wire rope either:

- The original tag is stamped with the date of resocketing;

**OR**

- The original tag is retained and a supplemental tag added that shows:

- The date of resocketing;

**AND**

- The name of the person or company that resocketed the rope.

- Make sure winding drum type hoists contain at least three wraps of the suspension wire rope on the drum when the suspended unit has reached the lowest possible point of its vertical travel.

- Make sure traction drum and sheave type hoists use wire rope long enough to reach the lowest possible point of vertical travel of the suspended unit, and an additional length of the wire rope of at least four feet (1.2 m).

- Make sure suspension wire rope is never lengthened or repaired.

- Make sure babbitted fastenings are never used with suspension wire rope.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70085, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-70090 Control circuits, power circuits and electrical protective devices.**

**Reference:** Unless otherwise specified in this chapter, make sure electrical wiring and equipment meet the requirements of Electrical, Part L in the General safety and health standards, chapter 296-24 WAC.

#### **You must:**

- Make sure electrical runway conductor systems are:
  - Designed for use in exterior locations;

**AND**

- Located so they do not come in contact with accumulated snow or water.

- Make sure cables are protected against damage resulting from over-tensioning or other causes.

- Make sure the control system requires the operator to follow predetermined procedures to operate suspended or supported equipment.

[Title 296 WAC—p. 3082]

- Make sure the control system has:

- Devices included to protect the equipment against electrical overloads, three-phase reversal and phase failure;

**AND**

- A separate method that is independent of the direction control circuit to break the power circuit in case of an emergency or malfunction.

- Make sure installations where the carriage does not have a stability factor of at least four against overturning have electrical contacts provided and connected so that the operating devices for suspended or supported equipment will only function when the carriage is located and mechanically retained at an established operating point.

- Make sure the hoisting or suspension system has overload protection to prevent the equipment from operating in the "up" direction with a load greater than one hundred twenty-five percent of the rated load of the platform.

- Make sure an automatic detector is provided for each suspension point that will do both of the following if a suspension wire rope becomes slack:

- Interrupt power to all hoisting motors for travel in the "down" direction;

**AND**

- Apply the primary brakes.

**Note:** A continuous-pressure rigging-bypass switch designed for use during rigging is permitted. It can only be used during rigging.

#### **You must:**

- Make sure upper and lower directional switches are provided that are designed to prevent the travel of suspended units beyond safe upward and downward levels.

- Make sure remote controlled, roof-powered manned platforms have an emergency stop switch located adjacent to each control station on the platform.

- Make sure cables which are in constant tension have overload devices which will prevent the tension in the cable from interfering with:

- The device that limits the hoist from lifting a load greater than one hundred twenty-five percent of the rated load of the platform;

**AND**

- The platform roll limiting device required by WAC 296-870-70050, Suspended working platforms and manned platforms used on supported equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060. 06-19-075, § 296-870-70090, filed 9/19/06, effective 1/1/07.]

### **WAC 296-870-800 Definitions.**

**Anemometer.** An instrument for measuring wind velocity.

**Angulated roping.** A suspension method where the upper point of suspension is inboard from the attachments on the suspended unit, thus causing the suspended unit to bear against the face of the building.

**Building face rollers.** A specialized form of guide roller designed to ride on the face of the building wall to prevent the platform from abrading the face of the building and to assist in stabilizing the platform.

**Building maintenance.** Operations such as window cleaning, caulking, metal polishing, reglazing, and general maintenance on building surfaces.

**Cable.** A conductor, or group of conductors, enclosed in a weatherproof sheath, that may be used to:

- Supply electrical power or control current for equipment;

**OR**

- Provide voice communication circuits.

**Carriage.** A wheeled vehicle used for the horizontal movement and support of other equipment.

**Certification.** A written, signed, and dated statement confirming the performance of a requirement.

**Combination cable.** A cable having both steel structural members capable of supporting the platform, and copper or other electrical conductors insulated from each other and the structural members by nonconductive barriers.

**Competent person.** Someone who:

- Is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees;

**AND**

- Has the authority to take prompt corrective measures to eliminate them.

**Continuous pressure.** Operation of a control by requiring constant manual actuation for the control to function.

**Control.** A system or mechanism used to regulate or guide the operation of equipment.

**Davit.** A device, used singly or in pairs, for suspending a powered platform from work, storage and rigging locations on the building being serviced. Unlike outriggers, a davit reacts its operating load into a single roof socket or carriage attachment.

**Design factor.** The ratio of the rated strength of the suspension wire rope to the rated working load. It is calculated using the following formula:

$$F = (S \times N) / W$$

Where:

F = Design factor

S = Manufacturer's rated strength of one suspension rope

N = Number of suspension ropes under load

W = Rated working load on all ropes at any point of travel.

**Equivalent.** Alternative design, material or method to protect against a hazard. You have to demonstrate it provides an equal or greater degree of safety for employees than the method, material or design specified in the rule.

**Existing installation.** A permanent powered platform installation that:

- Was completed before July 23, 1990;

**AND**

- Has had no major modification done after July 23, 1990.

**Ground rigging.** A method of suspending a working platform starting from a safe surface to a point of suspension above the safe surface.

**Ground rigged davit.** A davit which cannot be used to raise a suspended working platform above the building face being serviced.

**Guide button.** A building face anchor designed to engage a guide track mounted on a platform.

**Guide roller.** A rotating cylindrical member that provides continuous engagement between the suspended or supported equipment and the building guides. It may operate separately or as part of a guide assembly.

**Guide shoe.** A device that is similar to a guide roller but is designed to provide a sliding contact between the shoe and the building guides.

**Hoisting machine.** A device intended to raise and lower a suspended or supported unit.

**Installation.** A powered platform installation consists of all the equipment and the parts of the building involved with using the powered platform for building maintenance.

**Interlock.** A device designed to ensure that operations or motions occur in proper sequence.

**Intermittent stabilization.** A method of platform stabilization in which the angulated suspension wire ropes are secured to regularly spaced building anchors.

**Lanyard.** A flexible line of rope, wire rope or strap which is used to secure the body harness to a deceleration device, lifeline or anchorage.

**Lifeline.** A component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline). It serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**Live load.** The total static weight of workers, tools, parts, and supplies that the equipment is designed to support.

**New installation.** A permanent powered platform installation that was completed, or an existing installation that has had major modifications done, after July 23, 1990.

**Operating control.** A mechanism regulating or guiding the operation of equipment that makes sure the equipment operates in a specific mode.

**Operating device.** A push button, lever, or other manual device used to actuate a control.

**Outrigger.** A device, used singly or in pairs, for suspending a working platform from work, storage, and rigging locations on the building being serviced. Unlike davits, an outrigger reacts its operating moment load as at least two opposing vertical components acting into two or more distinct roof points and/or attachments.

**Poured socket.** A method of providing wire rope termination in which the ends of the rope are held in a tapered socket by means of poured spelter or resins.

**Primary brake.** A brake designed to be applied automatically whenever power to the prime mover is interrupted or discontinued.

**Prime mover.** The source of mechanical power for a machine.

**Rated load.** The manufacturer's specified maximum load.

**Rated strength.** The strength of wire rope, as designated by its manufacturer or vendor, based on standard testing procedures or acceptable engineering design practices.

**Rated working load.** The combined static weight of workers, materials, and suspended or supported equipment.

**Registered professional engineer.** A person who has been duly and currently registered and licensed by an authority within the United States or its territories to practice the profession of engineering.

**Roof-powered platform.** A powered platform having the raising and lowering mechanism located on the roof.

**Roof-rigged davit.** A davit used to raise the suspended working platform above the building face being serviced. This type of davit can also be used to raise a suspended working platform which has been ground rigged.

**Rope.** The equipment, such as wire rope, that is used to suspend a component of an equipment installation.

**Safe surface.** A horizontal surface that provides reasonable assurance that personnel occupying the surface will be protected from falls. This protection can be provided by location, a fall protection system, or other equivalent method.

**Secondary brake.** A brake designed to arrest the descent of the suspended or supported equipment in the event of an overspeed condition.

**Stability factor.** The ratio of the stabilizing moment to the overturning moment.

**Stabilizer tie.** A flexible line connecting the building anchor and the suspension wire rope supporting the platform.

**Supported equipment.** Building maintenance equipment that is held in or moved to its working position by means of attachment directly to the building or extensions of the building being maintained.

**Suspended equipment.** Building maintenance equipment that is suspended and raised or lowered to its working position by means of ropes or combination cables attached to some anchorage above the equipment.

**Tie-in guides.** The portion of a building that provides continuous positive engagement between the building and a suspended or supported unit during its vertical travel on the face of the building.

**Transportable outriggers.** Outriggers designed to be moved from one work location to another.

**Type F powered platform.** A powered platform that has both of the following characteristics:

- The working platform is suspended by at least four wire ropes and designed so that failure of any one wire rope will not substantially alter the normal position of the working platform

- Only one layer of hoisting rope is permitted on the winding drums.

**Type T powered platform.** A powered platform installation that has a working platform suspended by at least two wire ropes. The platform will not fall to the ground if a wire rope fails, but the working platform's normal position would be upset.

**Weatherproof.** Constructed or protected so that exposure to the weather will not interfere with successful operation.

**Winding drum hoist.** A type of hoisting machine that accumulates the suspension wire rope on the hoisting drum.

**Working platform.** The suspended or supported equipment intended to provide access to the face of the building and manned by persons engaged in building maintenance.

**Wrap.** One complete turn of the suspension wire rope around the surface of a hoist drum.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 47.17.060, 06-19-075, § 296-870-800, filed 9/19/06, effective 1/1/07.]

## Chapter 296-874 WAC

## SCAFFOLDS

## WAC

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296-874-30040	Meet these requirements when using multipoint adjustable suspension scaffolds.
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296-874-40004	Prevent supported scaffolds from tipping.
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296-874-40008	Provide safe access for persons erecting or dismantling supported scaffolds.
296-874-40010	Provide fall protection for persons erecting or dismantling supported scaffolds.
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296-874-40014	Meet these requirements when using bricklayers' square scaffolds (squares).
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296-874-40018	Meet these requirements when using fabricated frame scaffolds (tubular welded frame scaffolds).
296-874-40020	Meet these requirements when using integral prefabricated scaffold access frames.
296-874-40022	Meet these requirements when using form scaffolds and carpenter's bracket scaffolds.
296-874-40024	Meet these requirements when using horse scaffolds.
296-874-40026	Meet these requirements when using ladder jack scaffolds.
296-874-40028	Meet these requirements when using outrigger scaffolds.
296-874-40030	Meet these requirements when using pole scaffolds.
296-874-40032	Meet these requirements when using pump jack scaffolds.
296-874-40034	Meet these requirements when using repair bracket scaffolds.
296-874-40036	Meet these requirements when using roof bracket scaffolds.
296-874-40038	Meet these requirements when using step, platform and trestle ladder scaffolds.
296-874-40040	Meet these requirements when using tube and coupler scaffolds.
296-874-40042	Meet these requirements when using window jack scaffolds.
296-874-500	Definitions.

**WAC 296-874-100 Scope.** This chapter applies to suspended and supported scaffolds, including their supporting structure and anchorage points.

**Exemption:** This chapter does not apply to:

- Manually propelled elevating work platforms;
- Self-propelled elevating work platforms;
- Boom-supported elevating work platforms;
- Aerial lifts;
- Crane or derrick suspended personnel platforms;
- Personnel platforms supported by powered industrial trucks (PITs).

**Reference:** Additional requirements for the following types of platforms are found in the general safety and health standards, chapter 296-24 WAC. Go to the following sections:

- For elevating work platforms and aerial lifts, go to elevating work platforms, WAC 296-24-875;
- For crane or derrick suspended personnel platforms, go to WAC 296-24-23533;

- For personnel platforms supported by powered industrial trucks (PITs), go to WAC 296-24-230.

**Definition:**

A **scaffold** is a temporary elevated platform, including its supporting structure and anchorage points, used for supporting employees or materials.

A **suspended scaffold** is one or more platforms suspended from an overhead structure by ropes or other nonrigid means.

A **supported scaffold** is one or more platforms supported by rigid means such as outrigger beams, brackets, poles, legs, uprights, posts, or frames.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-100, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-200 General requirements for scaffolds.**

**Section contents:**

**Your responsibility:**

To make sure all scaffolds meet these requirements.

Make sure scaffolds are properly designed and constructed

WAC 296-874-20002.

Make sure scaffolds are erected, moved, altered, or dismantled by appropriate persons

WAC 296-874-20004.

Maintain structural integrity when intermixing scaffold components

WAC 296-874-20006.

Make sure platforms are properly planked or decked

WAC 296-874-20008.

Make sure platforms meet minimum width requirements

WAC 296-874-20010.

Meet these requirements when shorter platforms are used to create a longer platform

WAC 296-874-20012.

Lay platform planks properly when the platform changes direction

WAC 296-874-20014.

Stabilize the ends of platforms

WAC 296-874-20016.

Keep platform sag within acceptable limits

WAC 296-874-20018.

Provide safe access to scaffolds

WAC 296-874-20020.

Make sure portable, hook-on, and attachable ladders meet these requirements

WAC 296-874-20022.

Make sure stairway-type ladders meet these requirements

WAC 296-874-20024.

Make sure stair towers meet these requirements

WAC 296-874-20026.

Make sure stair rails and handrails meet these requirements

WAC 296-874-20028.

Make sure ramps and walkways used to access scaffolds meet these requirements

WAC 296-874-20030.

Make sure surfaces used to access scaffolds are close enough to use safely

WAC 296-874-20032.

Inspect scaffolds and scaffold components

WAC 296-874-20034.

Make sure damaged or weakened scaffolds meet minimum strength requirements

WAC 296-874-20036.

Make sure scaffolds are properly loaded

WAC 296-874-20038.

Protect employees when moving scaffolds

WAC 296-874-20040.

Increase employee working level height on scaffolds safely

WAC 296-874-20042.

Control loads being hoisted near scaffolds

WAC 296-874-20044.

Protect employees from energized power lines

WAC 296-874-20046.

Protect employees from weather hazards

WAC 296-874-20048.

Protect employees from slipping and tripping hazards

WAC 296-874-20050.

Provide fall protection for employees on scaffolds

WAC 296-874-20052.

Provide fall protection if the scaffold is too far from the work face

WAC 296-874-20054.

Provide specific fall protection for specific types of scaffolds

WAC 296-874-20056.

Make sure personal fall arrest systems meet these requirements

WAC 296-874-20058.

Make sure vertical lifelines used with personal fall arrest systems meet these requirements

WAC 296-874-20060.

Make sure horizontal lifelines used with personal fall arrest systems meet these requirements

WAC 296-874-20062.

Make sure guardrail systems meet these requirements

WAC 296-874-20064.

Provide falling object protection

WAC 296-874-20066.

Provide additional support lines on suspended scaffolds using a canopy for falling object protection

WAC 296-874-20068.

Make sure toeboards meet these requirements

WAC 296-874-20070.

Train employees who work on scaffolds

WAC 296-874-20072.

Train employees who erect, dismantle, operate or maintain scaffolds

WAC 296-874-20074.

Retrain employees when necessary

WAC 296-874-20076.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-200, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20002 Make sure scaffolds are properly designed and constructed.**

**You must:**

- Make sure scaffolds are:

– Designed by a qualified person;

**AND**

– Constructed according to that design.

- Prohibit the use of shore and lean-to scaffolds.

**Definition:**

A **qualified person** is one who has demonstrated the ability to solve problems related to the subject matter, work, or project. This can be done by having either:

- A recognized degree, certificate, or professional standing;

**OR**

- Extensive knowledge, training, and experience.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20002, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20004 Make sure scaffolds are erected, moved, altered, or dismantled by appropriate persons.**

**You must:**

- Make sure scaffolds are erected, moved, altered, or dismantled only when the work is:

– Supervised and directed by a competent person qualified in scaffold erection, moving, dismantling, or alteration;

**AND**

– Done by experienced and trained employees selected by the competent person.

**Definition:**

A **competent person** is someone who:

- Is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees;

**AND**

- Has the authority to take prompt corrective measures to eliminate them.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20004, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20006 Maintain structural integrity when intermixing scaffold components.**

**You must:**

- Make sure intermixed scaffold components:

– Fit together without force;

**AND**

– Maintain the scaffold's structural integrity.

- Make sure a qualified person determines that modifying components in order to intermix them will result in a structurally sound scaffold.

- Make sure scaffold components made of different metals are not used together.

**Exemption:** Different types of metals may be used together if a competent person determines that galvanic action will not reduce the strength of any component to less than the minimum strength required.

**Reference:** The minimum strength requirements are found in the following sections:

- Suspended scaffolds, WAC 296-874-30002;
- Supported scaffolds, WAC 296-874-40002.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20006, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20008 Make sure platforms are properly planked or decked.**

**You must:**

- Fully plank or deck each platform between the front uprights and the guardrail supports on all working levels of a scaffold so that there is no more than one inch (2.5 cm):

- Between adjacent units;

**AND**

- Between the platform and the uprights.

**Exemption:**

- There may be more than one inch between platform units if all of the following are met:
  - You can demonstrate that a wider space is necessary, such as to fit around uprights when side brackets are used to extend the platform width;
  - The platform is planked or decked as fully as possible;
  - The open space between the platform and the guardrail supports is nine and one-half inches (24.1 cm) or less.
- Platforms used solely as walkways or only by employees erecting or dismantling scaffolds do not have to be fully decked or planked if:
  - The planking provided makes for safe working conditions;

**AND**

- Employees on those platforms are protected from falling.

REFERENCE		
Fall protection requirements for employees:	Are located in the following chapters:	In the following sections:
On walkways within scaffolds	Chapter 296-874 WAC, Scaffolds	WAC 296-874-20056
Erecting or dismantling supported scaffolds	Chapter 296-874 WAC, Scaffolds	WAC 296-874-40010
Erecting or dismantling suspended scaffolds in general industry	Chapter 296-24 WAC, General safety and health standards	Part J-1 Working surfaces, guarding floors and wall openings, ladders AND Part J-3 Powered platforms
Erecting or dismantling suspended scaffolds in construction work	Chapter 296-155 WAC, Safety standards for construction work	Part C-1 Fall restraint and fall arrest AND Part K Floor openings, wall openings, and stairways

**You must:**

- Make sure wood platforms are not covered with an opaque finish.

**Exemption:** Platform edges may be covered or marked for identification.

**Note:** Platforms may be coated periodically with wood preservatives, fire-retardant finishes, or slip-resistant finishes if the coating does not obscure the top or bottom wood surfaces.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20008, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20010 Make sure platforms meet minimum width requirements.**

**You must:**

- Make sure scaffold platforms meet the minimum width requirements of Table 1, Minimum Platform Width.

(2007 Ed.)

**Table 1  
Minimum Platform Width**

Type of Scaffold	Minimum Platform Width Required
Ladder jack scaffold Pump jack scaffold Roof bracket scaffold Top plate bracket scaffold	12 inches (20 cm)
Boatswain's chair	No minimum width
All other scaffolds	18 inches (46 cm) <b>Exemption:</b> Platforms and walkways may be less than 18 inches (46 cm) wide if all of the following are met: <ul style="list-style-type: none"> <li>You can demonstrate that the area is so narrow that the platform or walkway cannot be at least 18 inches (46 cm) wide</li> <li>The platform or walkway is as wide as feasible</li> <li>Employees on those platforms or walkways are protected from falling by using guardrails or personal fall arrest systems.</li> </ul>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20010, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20012 Meet these requirements when using shorter platforms to create a longer platform.**

**You must:**

- Make sure, when platforms are overlapped to create a longer platform, that:
  - The overlap is over a support;

**AND**

- The platforms are either:

- Overlapped by at least twelve inches (30 cm);

**OR**

- Are nailed together or otherwise prevented from moving.

- Make sure, when platforms are butted together to create a longer platform, that each abutted platform end rests on a separate support surface.

**Note:**

Platforms may butt together on a common support member if the member is designed to support abutting platforms, such as either:

- A "T" section;

**OR**

- Hook-on platforms designed to rest on common supports.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20012, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20014 Lay platform planks properly when the platform changes direction.**

**You must:**

- Do the following whenever platforms overlap to change direction:
  - First lay the platform that rests on a bearer at an angle other than a right angle;

**THEN**

- Lay the platform that is perpendicular to the bearer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20014, filed 12/7/04, effective 3/1/05.]

#### **WAC 296-874-20016 Stabilize the ends of platforms.**

##### **You must:**

- Make sure each end of a platform:
  - Is cleated or restrained by hooks or equivalent means;
- OR**
- Extends over the centerline of its support at least six inches (15 cm).
  - Make sure the cantilevered portion of a platform meets at least one of the following:
    - Is designed and installed to support employees or material without tipping;
    - Has guardrails which block employee access to the cantilevered end;
    - Extends over its support not more than:
      - Twelve inches (30 cm) if the platform length is ten feet or less;
- OR**
- Eighteen inches (46 cm) if the platform length is greater than ten feet.

**Note:** The cantilevered portion of a platform is the portion that is not supported on one end.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20016, filed 12/7/04, effective 3/1/05.]

#### **WAC 296-874-20018 Keep platform sag within acceptable limits.**

##### **You must:**

- Make sure a loaded platform does not sag more than one-sixtieth of the span.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20018, filed 12/7/04, effective 3/1/05.]

#### **WAC 296-874-20020 Provide safe access to scaffolds.**

##### **You must:**

- Provide scaffold platforms more than two feet (0.6 m) above or below a point of access with at least one of the following means of access:
  - Portable, hook-on, or attachable ladder;
  - Stairway-type ladder;
  - Ladder stand;
  - Stair tower (scaffold stairway or tower);
  - Ramp;
  - Walkway;
  - Integral prefabricated scaffold access;
  - Direct access from another scaffold, structure, personnel hoist, or similar surface.
- Make sure crossbraces are not used as a means of access.

**Reference:** For requirements about integral prefabricated scaffold access, go to WAC 296-874-40020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20020, filed 12/7/04, effective 3/1/05.]

#### **WAC 296-874-20022 Make sure portable, hook-on, and attachable ladders meet these requirements.**

##### **You must:**

- Position portable, hook-on, and attachable ladders so they do not tip the scaffold.

- Make sure hook-on and attachable ladders meet all of the following:

- Specifically designed and used for that type of scaffold;

- Have rungs that are:

- Uniformly spaced;

- Not more than sixteen and three-quarters inches apart;

- At least eleven and one-half inches (29 cm) long;

- Lined up vertically between rest platforms.

- Position the bottom rung not more than twenty-four inches (61 cm) above the scaffold supporting level.

- Have rest platforms at vertical intervals not greater than twenty-four feet (7.3 m) on supported scaffolds.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20022, filed 12/7/04, effective 3/1/05.]

#### **WAC 296-874-20024 Make sure stairway-type ladders meet these requirements.**

##### **You must:**

- Make sure stairway-type ladders meet all of the following:

- Position the bottom step not more than twenty-four inches (61 cm) above the scaffold supporting level;

- Have rest platforms not more than twelve feet (3.7 m) apart vertically;

- Have slip-resistant surfaces on treads and landings;

- Have steps that:

- Are at least sixteen inches (41 cm) wide;

**AND**

- Line up vertically between rest platforms.

- Make sure mobile ladder stands have steps that are at least eleven and one-half inches (30 cm) wide.

##### **Definition:**

A **ladder stand** is a mobile, fixed-size, self-supporting ladder consisting of a wide flat tread ladder in the form of stairs.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20024, filed 12/7/04, effective 3/1/05.]

#### **WAC 296-874-20026 Make sure stair towers meet these requirements.**

##### **You must:**

- Make sure stair towers (scaffold stairways or towers) meet all of the following:

- Are positioned so the bottom step is not more than twenty-four inches (61 cm) above the scaffold supporting level;

- Are at least eighteen inches (45.7 cm) wide between stair rails;

- Have slip-resistant surfaces on treads and landings;

- Are installed at an angle of forty to sixty degrees from the horizontal.

- Provide a landing platform at least eighteen inches (45.7 cm) wide by eighteen inches (45.7 cm) long at each level.

- Provide guardrails on the open sides and ends of each landing.

**Reference:** For requirements about guardrails, go to WAC 296-874-20064.

**You must:**

- Make sure steps meet all of the following requirements:
  - Line up vertically between rest platforms;
  - Have uniform tread depth, within one-quarter inch (0.6 cm), for each flight of stairs;
  - Have uniform riser height, within one-quarter inch (0.6 cm), for each flight of stairs.

**Note:** Riser height may have larger variations at the top step and bottom step of the entire stair system, but not at the top and bottom steps within each flight of stairs.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20026, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20028 Make sure stair rails and handrails meet these requirements.****You must:**

- Provide a stair rail that meets all of the following on each side of a scaffold stairway:
  - Has a top rail and midrail;
  - Has a top rail that can serve as a handrail if a separate handrail is not provided;
  - Is at least twenty-eight inches (71 cm) but not more than thirty-seven inches (94 cm) high.

**Note:** Stair rail height is measured from the upper surface of the stair rail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

**You must:**

- Make sure stair rail systems and handrails have:
  - A surface that prevents employees from:
    - Being injured by punctures or lacerations;
  - OR
  - Snagging their clothing.
- Make sure handrails, and top rails that are used as handrails:
  - Provide an adequate handhold for employees to grasp to avoid falling;

**AND**

- Are at least three inches (7.6 cm) from other objects.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20028, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20030 Make sure ramps and walkways used to access scaffolds meet these requirements.****You must:**

- Make sure ramps and walkways are not inclined at a slope steeper than one vertical in three horizontal (1:3 or twenty degrees from the horizontal).
  - Make sure ramps and walkways that are inclined at a slope steeper than one vertical in eight horizontal (1:8) have cleats to provide footing which are:
    - Securely fastened to the planks;
- AND**
- Spaced not more than fourteen inches (35 cm) apart.

**Reference:** Ramps and walkways that are four feet (1.2 m) or more above a lower level need to have a guardrail system. Those requirements are found in other chapters.

- For general industry activities, go to:
  - Working surfaces, guarding floors and wall openings, ladders, Part J-1, in the general safety and health standards, chapter 296-24 WAC;
  - For construction activities, go to:

■ Floor openings, wall openings, and stairways, Part K, in the safety standards for construction work, chapter 296-155 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20030, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20032 Make sure surfaces used to access scaffolds are close enough to use safely.****You must:**

- Make sure a surface used to provide access to or from a scaffold is not further from the scaffold than:
  - Fourteen inches (36 cm) horizontally;
  - Twenty-four inches (61 cm) vertically.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20032, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20034 Inspect scaffolds and scaffold components.****You must:**

- Make sure scaffolds and scaffold components are inspected for visible defects by a competent person:
    - Before each work shift;
- AND**
- After anything occurs that could affect the scaffold's structural integrity.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20034, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20036 Make sure damaged or weakened scaffolds meet minimum strength requirements.****You must:**

- Make sure any scaffold or scaffold component that has been damaged or weakened so that it no longer meets the minimum strength requirements of this chapter, is immediately either:
    - Repaired, replaced, or braced to meet the minimum strength requirements;
- OR**
- Removed from service until repaired.

**Reference:** For information on minimum strength requirements for suspended and supported scaffolds, go to the following sections within this chapter:

- Make sure suspended scaffolds and scaffold components meet these strength requirements, WAC 296-874-30002;
- Make sure supported scaffolds and scaffold components meet these strength requirements, WAC 296-874-40002.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20036, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20038 Make sure scaffolds are properly loaded. You must:**

- Load scaffolds as specified in the:
    - Manufacturer's instructions;
- OR**
- Design of the qualified person.
- Make sure scaffolds and scaffold components do not exceed their maximum intended load or rated load, whichever is less.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20038, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20040 Protect employees when moving scaffolds.****You must:**

• Make sure scaffolds are not moved horizontally while employees are on them.

**Exemption:** A scaffold may be moved horizontally with employees on it if the scaffold:

- Has been specifically designed for such movement by a registered professional engineer;

**OR**

- Is a mobile scaffold that meets the requirements of the section, Meet these requirements when moving mobile scaffolds, WAC 296-874-40012.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20040, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20042 Increase employee working level height on scaffolds safely.****You must:**

• Make sure makeshift devices, such as boxes and barrels, are not used on scaffold platforms to increase the working level height for employees.

• Meet all of the following when using stilts on scaffolds:

- Use stilts only on large area scaffolds;
- Increase the height of a guardrail system used for fall protection by an amount equal to the height of the stilts being used;

– Make sure scaffold platforms where stilts are used are flat and free of:

- Pits, holes, and obstructions such as debris;

**AND**

- Other tripping or falling hazards.

– Make sure stilts are:

- Properly maintained;

**AND**

■ The original equipment is not altered without the manufacturer's approval.

• Meet all of the following when using ladders on scaffolds:

- Use ladders only on large area scaffolds;
- Secure the platform units to the scaffold to prevent movement;

– Secure the scaffold against the sideways thrust exerted by the ladder if the ladder is placed against a structure that's not part of the scaffold;

– Make sure the ladder legs are:

■ Secured to prevent them from slipping or being pushed off the platform;

**AND**

■ On the same scaffold platform, or use other means, to stabilize the ladder against uneven platform deflection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20042, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20044 Control loads being hoisted near scaffolds.****You must:**

• Use a tag line or equivalent measures to control loads being hoisted onto or near a scaffold if the load could swing and contact the scaffold.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20044, filed 12/7/04, effective 3/1/05.]

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**WAC 296-874-20046 Protect employees from energized power lines.****You must:**

• Make sure scaffolds are erected, moved, altered, or dismantled so that they, and any conductive material handled on them, are kept at least as far from exposed and energized power lines as shown in Table 2, Minimum Separation Distance from Energized Power Lines.

**Table 2**  
**Minimum Separation Distance from Energized Power Lines**

<b>Voltage</b>	<b>Minimum Separation Distance</b>
Less than 300 volts (insulated lines)	3 feet (0.9 m)
Less than 300 volts (uninsulated lines)	10 feet (3.1 m)
300 volts to 50 kv	10 feet (3.1 m)
More than 50 kv	10 feet (3.1 m) + 0.4 inches (1.0 cm) for each 1 kv over 50 kv <b>Note:</b> You may use an alternative minimum separation distance of 2 times the length of the line insulator, but never less than 10 feet (3.1 m).

**Exemption:** Scaffolds and conductive materials handled on scaffolds may be closer to power lines than the minimum separation distance specified in Table 2 if **all** of the following are met:

- Less clearance is necessary to do the work;
- The utility company or electrical system operator has been notified of the need to work closer to the power lines;
- The utility company or electrical system operator has done at least one of the following:
  - Deenergized the lines;
  - Relocated the lines to meet the minimum separation distance requirement;
  - Installed protective coverings over the lines to prevent accidental contact.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20046, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20048 Protect employees from weather hazards. You must:**

• Prohibit work on or from scaffolds during storms or high winds unless both of the following are met:

– A competent person has determined that it is safe for employees to be on the scaffold;

– The employees are protected by either:

- A personal fall arrest system;

**OR**

- Wind screens.

• Make sure wind screens are not used unless the scaffold is secured against the anticipated wind forces.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20048, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20050 Protect employees from slipping and tripping hazards.****You must:**

- Make sure debris does not accumulate on platforms.
- Prohibit employees from working on scaffolds covered with snow, ice, or other slippery material.

**Exemption:** Employees may be on scaffolds as necessary to remove the slipping hazard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20050, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-20052 Provide fall protection for employees on scaffolds.**

**You must:**

- Protect each employee on a scaffold more than ten feet (3.1 m) above a lower level, from falling to the lower level, by providing either:

– A personal fall arrest system;

**OR**

– Guardrails.

REFERENCE		
Fall protection requirements for employees:	Are located in the following chapters:	In the following sections:
On walkways within scaffolds	Chapter 296-874 WAC, Scaffolds	WAC 296-874-20056
Erecting or dismantling supported scaffolds	Chapter 296-874 WAC, Scaffolds	WAC 296-874-40010
Erecting or dismantling suspended scaffolds in general industry	Chapter 296-24 WAC, General safety and health standards	Part J-1 Working surfaces, guarding floors and wall openings, ladders AND Part J-3 Powered platforms
Erecting or dismantling suspended scaffolds in construction work	Chapter 296-155 WAC, Safety standards for construction work	Part C-1 Fall restraint and fall arrest AND Part K Floor openings, wall openings, and stairways

**You must:**

- Make sure employees erecting the scaffold install the guardrail system, if required, before the scaffold is used by any other employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20052, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-20054 Provide fall protection if a scaffold is too far from the work face.**

**You must:**

- Provide a guardrail system along the front edge of the platform, or have employees use a personal fall arrest system, if the distance from the front edge of the platform to the work face is greater than:

– Eighteen inches (46 cm) for scaffolds used for plastering and lathing operations;

– Fourteen inches (36 cm) for all other scaffolds.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20054, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-20056 Provide specific fall protection for specific types of scaffolds.**

**You must:**

(2007 Ed.)

- Use a personal fall arrest system to protect employees on the following scaffolds:

– Boatswain's chair;

– Catenary scaffold;

– Float scaffold;

– Ladder jack scaffold;

– Needle beam scaffold.

- Use a personal fall arrest system **and** a guardrail system to protect employees on:

– Single-point adjustable suspension scaffolds;

**AND**

– Two-point adjustable suspension scaffolds.

- Protect employees working on a crawling board (chicken ladder) by using at least one of the following:

– A personal fall arrest system;

– A guardrail system with a minimum two hundred pound toprail capacity;

– A three-quarter inch (1.9 cm) diameter grabline or equivalent handhold securely fastened beside each crawling board.

- Protect employees working on a self-contained adjustable scaffold that has the platform:

– Supported by the frame structure, using a guardrail system with a minimum two hundred pound toprail capacity.

– Suspended by ropes, using:

■ A guardrail system with a minimum two hundred pound toprail capacity;

**AND**

■ A personal fall arrest system.

- Protect employees on walkways located within a scaffold by using a guardrail system that meets all of the following:

– Has a minimum two hundred pound toprail capacity;

– Is installed within nine and one-half inches (24.1 cm) of the walkway;

– Is installed along at least one side of the walkway.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20056, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-20058 Make sure personal fall arrest systems meet these requirements.**

**You must:**

- Make sure personal fall arrest systems used on scaffolds for general industry activities, meet the requirements of personal fall arrest system, Appendix C, Part 1, WAC 296-24-88050, in powered platforms, Part J-3, found in the general safety and health standards, chapter 296-24 WAC.

- Make sure personal fall arrest systems are attached by a lanyard to one of the following:

– Vertical lifeline;

– Horizontal lifeline;

– Appropriate structural member of the scaffold.

**Reference:** Requirements for personal fall arrest systems used on scaffolds for construction activities are in fall restraint and fall arrest, Part C-1, found in the safety standards for construction work, chapter 296-155 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20058, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20060 Make sure vertical lifelines used with personal fall arrest systems meet these requirements.**

**You must:**

- Make sure vertical lifelines are all of the following:
  - Fastened to a fixed, safe point of anchorage;
  - Independent of the scaffold;
  - Protected from sharp edges and abrasion.

**Note:** Safe points of anchorage include structural members of buildings, but do **not** include:

- Standpipes, vents, or other piping systems;
- Electrical conduit;
- Outrigger beams;
- Counterweights.

**You must:**

- Make sure vertical lifelines, independent support lines, and suspension ropes are **not** attached to any of the following:
  - Each other;
  - The same point of anchorage;
  - The same point on the scaffold.
- Make sure vertical lifelines, independent support lines, and suspension ropes do not use the same point of anchorage.
- Make sure independent support lines and suspension ropes are not attached to a personal fall arrest system.
- Make sure vertical lifelines are not used with single-point or two-point adjustable suspension scaffolds that have overhead components such as overhead protection or additional platform levels.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20060, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20062 Make sure horizontal lifelines used with personal fall arrest systems meet these requirements.**

**You must:**

- Equip single-point or two-point adjustable suspension scaffolds that use horizontal lifelines or structural members of the scaffold for fall protection with both of the following:
    - Additional independent support lines that are equal in number and equivalent in strength to the suspension ropes;
    - Automatic locking devices capable of stopping the scaffold from falling if one or both of the suspension ropes fail.
  - Make sure horizontal lifelines are secured to either:
    - Two or more structural members of the scaffold;
- OR**
- Looped around both the suspension ropes and independent support lines above the hoist and brake attached to the end of the scaffold.
  - Make sure independent support lines and suspension ropes are **not**:
    - Attached to each other or the same point on the scaffold;
    - Attached to or use the same point of anchorage.
  - Make sure independent support lines and suspension ropes are not attached to either:
    - A personal fall arrest system;
- OR**
- The same point on the scaffold as a personal fall arrest system.

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- Make sure, if a horizontal lifeline is used where it may become a vertical lifeline, that the device used to connect a lanyard to the horizontal lifeline is capable of locking in both directions on the lifeline.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20062, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20064 Make sure guardrail systems meet these requirements.**

**You must:**

- Make sure guardrails, if required, are installed along all open sides and ends of platforms.

**Exemption:** For employees doing overhand bricklaying operations from a supported scaffold, a guardrail is not required on the side next to the wall.

**Definition:**

Overhand bricklaying is the process of laying bricks and masonry units so that the surface of the wall is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. It includes mason tending and electrical installation incorporated into the brick wall.

**You must:**

- Make sure the height of the toprail top edge, or the equivalent member, of supported scaffolds is:
  - At least thirty-six inches (0.9 m) and not more than forty-five inches (1.2 m) above the platform surface for scaffolds manufactured or first placed in service **before January 1, 2000**;
  - At least thirty-eight inches (0.97 m) and not more than forty-five inches (1.2 m) above the platform surface for scaffolds manufactured or first placed in service **after January 1, 2000**.
- Make sure the height of the toprail top edge, or the equivalent member, of suspended scaffolds that require guardrails and personal fall arrest systems, is at least thirty-six inches (0.9 m) and not more than forty-five inches (1.2 m) above the platform surface.

**Exemption:** When conditions warrant, the height of the top edge of the toprail may be greater than forty-five inches if the guardrail system meets all other criteria of this chapter.

**You must:**

- Make sure the top edge of the toprail doesn't drop below the required height when the minimum load, shown in Table 3, Minimum Toprail and Midrail Strength Requirements, is used.
- Each toprail and midrail, or equivalent member, of a guardrail system must be able to withstand, without failure, the force shown in Table 3, Minimum Toprail and Midrail Strength Requirements, when the force is applied as follows:
  - To the toprail in a downward or horizontal direction at any point along its top edge;
  - To the midrail in a downward or horizontal direction at any point.

**Note:** Midrail includes screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of the guardrail system.

(2007 Ed.)

**Table 3**  
**Minimum Toprail and Midrail Strength Requirements**

Type of Scaffold	Toprail Capacity	Midrail Capacity
<ul style="list-style-type: none"> <li>• Single-point adjustable suspension scaffolds</li> <li>• Two-point adjustable suspension scaffolds</li> </ul>	100 pounds (445 n)	75 pounds (333 n)
<ul style="list-style-type: none"> <li>• All other scaffolds</li> <li>• Walkways within a scaffold</li> </ul>	200 pounds (890 n)	150 pounds (666 n)

**You must:**

• Install midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members as follows:

– Midrails at a height approximately midway between the top edge of the guardrail system and the platform surface;  
– Screens and mesh:

■ From the top edge of the guardrail system to the scaffold platform;

AND

■ Along the entire opening between the supports;

– Intermediate members, such as balusters or additional rails, not more than nineteen inches (48 cm) apart.

• Make sure steel or plastic banding is not used as a toprail or midrail.

• Have a competent person inspect manila rope and plastic or other synthetic rope that is used as a toprail or midrail as frequently as necessary to make sure it continues to meet the strength requirements for a toprail or midrail.

**Note:** Crossbraces may be used as a toprail or midrail in a guardrail system if they meet the following requirements:

- The crossing point of the two braces is between:
  - 20" and 30" above the work platform when used as a midrail.
  - 38" and 48" above the work platform when used as a toprail.
- The end points at each upright are not more than 48" apart.

**You must:**

• Make sure guardrails have a surface that prevents:  
– Puncture and laceration injuries;

AND

– Snagging clothing.

• Make sure any rail extending beyond the post of a guardrail does not create a projection hazard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20064, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20066 Provide falling object protection.**

**Reference:** Hardhats and possibly other personal protective equipment has to be used to protect employees exposed to overhead hazards.

- Those requirements are found in the safety and health core rules, chapter 296-800 WAC.
- Go to Personal protective equipment (PPE), WAC 296-800-160.

**You must:**

(2007 Ed.)

• Protect employees from being struck by tools, materials, or equipment falling from a scaffold by doing one or more of the following:

– Use a barricade to keep employees out of the area where falling objects could be a hazard;

– Install a toeboard along the edge of the platform anywhere an object could fall on an employee below;

– Install paneling or screening that covers from the top of the guardrail to the toeboard or platform anywhere the toeboard is **not** high enough to keep objects from falling off the platform;

– Install a guardrail system with openings small enough to keep potential falling objects from passing through;

– Erect a canopy structure, debris net, or catch platform over employees that does all of the following:

■ Will contain or deflect falling objects;

■ Is strong enough to withstand the impact forces;

■ Is installed between the falling object hazard and the employees.

• Make sure potential falling objects that are too large or heavy to be contained or deflected by the falling object protection you are using are:

– Moved away from the edge of the surface they could fall from;

AND

– Secured, as necessary, to prevent falling.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20066, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20068 Provide additional support lines on suspended scaffolds using a canopy for falling object protection.**

**You must:**

• Equip suspended scaffolds, that use a canopy for falling object protection, with additional independent support lines that meet all of the following:

– Have the same number of support lines as there are suspension ropes;

– Are equivalent in strength to the suspension ropes;

– Are not attached to the same point of anchorage as the suspension ropes.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20068, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20070 Make sure toeboards meet these requirements.**

**You must:**

• Make sure toeboards, when used, are:

– At least three and one-half inches (9 cm) high from the top edge of the toeboard to the platform;

– Securely fastened along the outer edge of the platform;

– Installed for enough distance along the platform to protect employees below;

– Installed so the gap between the bottom of the toeboard and the platform is one-quarter inch (0.7 cm) or less;

– Solid or with openings that are one inch (2.5 cm) or less in the largest dimension;

– Able to withstand, without failing, a force of at least fifty pounds (222 n) applied in a downward or horizontal direction anywhere along the toeboard.

[Title 296 WAC—p. 3093]

**Exemption:** On float (ship) scaffolds, an edging of three-quarters by one and one-half inch (2 x 4 cm) wood or the equivalent may be used instead of a toeboard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20070, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20072 Train employees who work on a scaffold. You must:**

- Have a qualified person train each employee who works on a scaffold to:
  - Recognize the hazards associated with the type of scaffold they are using;

**AND**

- Understand the procedures to control or minimize the hazards.

- Include the following subjects in your training:
  - Hazards in the work area and how to deal with them, including:

- Electrical hazards;

- Fall hazards;

- Falling object hazards;

- How to erect, maintain, and disassemble the fall protection and falling object protection systems being used;

- How to:

- Use the scaffold;

- Handle materials on the scaffold;

- The load-carrying capacity and maximum intended load of the scaffold;

- Any other requirements of this chapter that apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20072, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20074 Train employees who erect, dismantle, operate or maintain scaffolds.**

**You must:**

- Have a competent person train each employee who erects, disassembles, moves, operates, repairs, maintains, or inspects scaffolds to recognize any hazards associated with the work.

- Make sure the training includes at least the following subjects:

- Hazards in the work area and how to deal with them;

- The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold being used;

- The design criteria, maximum intended load-carrying capacity and intended use of the scaffold;

- Any other requirements of this chapter that apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20074, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-20076 Retrain employees when necessary.**

**You must:**

- Retrain employees to reestablish proficiency if you believe they lack the skill or understanding to safely erect, use, or dismantle a scaffold.

- Retraining is required in at least the following situations:

- An employee's work involving scaffolds is inadequate and indicates they lack the necessary proficiency;

[Title 296 WAC—p. 3094]

- A change in **any** of the following that presents a hazard the employee has not been trained for:

- Worksite;

- Type of scaffold;

- Fall protection;

- Falling object protection;

- Other equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-20076, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-300 Suspended scaffolds.**

**Section contents:**

**Your responsibility:**

To meet these requirements when using suspended scaffolds.

Make sure suspended scaffolds and scaffold components meet these strength requirements

WAC 296-874-30002.

Make sure suspended scaffold outrigger beams meet these requirements

WAC 296-874-30004.

Make sure counterweights are safe and used properly

WAC 296-874-30006.

Make sure tiebacks meet these requirements

WAC 296-874-30008.

Make sure suspended scaffold support devices meet these requirements

WAC 296-874-30010.

Make sure scaffold hoists meet these requirements

WAC 296-874-30012.

Make sure scaffold hoists retain enough suspension rope

WAC 296-874-30014.

Make sure wire rope is in good condition

WAC 296-874-30016.

Make sure wire suspension rope connections meet these requirements

WAC 296-874-30018.

Make sure wire rope clips are used properly

WAC 296-874-30020.

Prevent swaying of two-point and multipoint suspension scaffolds

WAC 296-874-30022.

Use emergency escape and rescue devices appropriately

WAC 296-874-30024.

Protect suspension ropes from heat or corrosive substances

WAC 296-874-30026.

Take precautions while welding

WAC 296-874-30028.

Prohibit use of gasoline-powered equipment on suspended scaffolds

WAC 296-874-30030.

Meet these requirements when using catenary scaffolds

WAC 296-874-30032.

Meet these requirements when using float (ship) scaffolds

WAC 296-874-30034.

Meet these requirements when using interior hung scaffolds

WAC 296-874-30036.

Meet these requirements when using multilevel suspended scaffolds

WAC 296-874-30038.

Meet these requirements when using multipoint adjustable suspension scaffolds

WAC 296-874-30040

Meet these requirements when using needle beam scaffolds

WAC 296-874-30042.

Meet these requirements when using single-point adjustable suspension scaffolds

WAC 296-874-30044.

Meet these requirements when using two-point adjustable suspension scaffolds (swing stages)

WAC 296-874-30046.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-300, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30002 Make sure suspended scaffolds and scaffold components meet these strength requirements.**

**You must:**

- Meet the following strength requirements:
  - Suspended scaffolds must support, without failure, the total of their own weight plus four times the maximum intended load;

- Suspended scaffold components must meet the requirements contained in Table 4, Suspended Scaffold Strength Requirements.

- Surfaces that support scaffold support devices must withstand four times the rated load of the hoist.

**Note:** Scaffold support devices include outrigger beams, cornice hooks, parapet clamps, and similar devices.

**Table 4**

**Suspended Scaffold Strength Requirements**

<b>These scaffold components:</b>	<b>Must meet these strength requirements:</b>
Adjustable scaffold – Suspension ropes, including connecting hardware	Support six times the rated load of the hoist.
Adjustable scaffold – Direct connections to roofs and floors – Counterweights used to balance the scaffold	Resist four times the tipping moment with the scaffold operating at the rated load of the hoist.
Nonadjustable scaffold – Suspension ropes, including connecting hardware	Support six times the maximum intended load applied or transmitted to the rope.
All other scaffold components	Support its own weight plus four times the maximum intended load.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30002, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30004 Make sure suspended scaffold outrigger beams meet these requirements.**

**You must:**

- Make sure outrigger beams are made of structural metal or equivalent strength material.

(2007 Ed.)

- Stabilize the inboard ends of outrigger beams by using either:

- Bolts or other direct connections to the floor or roof deck;

**OR**

- Counterweights and tiebacks.

**Exemption:** Masons' multipoint adjustable scaffold outrigger beams **cannot** be stabilized by counterweights.

**You must:**

- Make sure, before the scaffold is used, that a competent person:

- Evaluates the direct connections;

**AND**

- Confirms that the supporting surfaces can support the loads placed on them.

- Make sure suspended scaffold outrigger beams are all of the following:

- Restrained to prevent moving;

- Provided with stop bolts or shackles at both ends;

- Securely fastened together with the flanges turned out when channel iron beams are used in place of I-beams;

- Set and maintained with the web in a vertical position;

- Placed so the suspension rope is centered over the stirrup.

- Place outrigger beams at a right angle (perpendicular) to their bearing support.

**Exemption:** Outrigger beams can be placed at other than a right angle (perpendicular) if:

- You can demonstrate that immovable obstructions make it impossible to place the beams at a right angle (perpendicular) to their bearing support;

**AND**

- Opposing angle tiebacks are used.

**Note:** The angle between the outrigger beam and the bearing support is usually the same as the angle between the outrigger beam and the face of the building or structure.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30004, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30006 Make sure counterweights are safe and used properly.**

**You must:**

- Make sure counterweights:

- Are made of material that cannot flow;

**AND**

- Have been specifically designed to be used as counterweights.

**Note:** The following cannot be used as counterweights:

- Sand, gravel and similar materials that can be easily dislocated;
- Construction material such as masonry units and roofing felt.

**You must:**

- Secure counterweights to outrigger beams by mechanical means to prevent them from being accidentally detached.

- Leave counterweights attached to the outrigger beams until after the scaffold has been disassembled.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30006, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30008 Make sure tiebacks meet these requirements.**

**You must:**

- Make sure tiebacks are equivalent in strength to the suspension ropes.
- Make sure tiebacks are secured to a structurally sound anchorage on the building or structure and installed:
  - At a right angle (perpendicular) to the face of the building or structure;
- OR**
- As opposing angle tiebacks.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30008, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30010 Make sure suspended scaffold support devices meet these requirements.**

**You must:**

- Make sure suspended scaffold support devices, such as cornice hooks, roof hooks, roof irons, parapet clamps, or similar devices, are:
  - Made of steel, wrought iron, or other material of equivalent strength;
  - Supported by bearing blocks;
  - Prevented from moving by using tiebacks.

**Reference:**

- For outrigger beam requirements, go to WAC 296-874-30004;
- For tieback requirements go to WAC 296-874-30008.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30010, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30012 Make sure scaffold hoists meet these requirements.**

**You must:**

- Make sure the stall load of any scaffold hoist is **not** more than three times its rated load.
- Make sure the design of scaffold hoists has been tested by an independent nationally recognized testing laboratory.
- Make sure scaffold hoists have both a:
  - Normal operating brake;

**AND**

- Braking device or locking pawl which automatically engages when the hoist has an uncontrolled:

- Instantaneous change in momentum;

**OR**

- An accelerated overspeed.

- Prohibit use of gasoline-powered hoists on suspended scaffolds.
  - Enclose the gears and brakes of power-operated hoists used on suspended scaffolds.
  - Make sure manually operated hoists need a positive crank force to descend.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30012, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30014 Make sure scaffold hoists retain enough suspension rope.**

**You must:**

- Make sure the suspension rope on winding drum hoists is long enough to wrap around the drum at least four times when the scaffold is at its lowest point of travel.
- Make sure the suspension rope on hoists that do **not** use a winding drum:

[Title 296 WAC—p. 3096]

- Is long enough to allow the scaffold to be lowered to the level below without the rope end passing through the hoist;

**OR**

- Has the rope end configured, or uses other means, to prevent it from passing through the hoist.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30014, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30016 Make sure wire rope is in good condition. You must:**

- Make sure a competent person inspects each rope for defects:

- Before each work shift;

**AND**

- After anything happens that could affect the rope's integrity.

- Replace a rope if it has any of the following:

- Physical damage which impairs the function and strength of the rope;
- Kinks that could impair the tracking or wrapping of the rope around a drum or sheave;
- Six randomly distributed broken wires in one rope lay;
- Three broken wires in one strand of one rope lay;
- Loss of more than one-third of the original diameter of the outside wires caused by abrasion, corrosion, scrubbing, flattening or peening;
- Heat damage caused by a torch;
- Any damage caused by contact with electrical wires;
- Evidence that the secondary brake has been activated during an overspeed condition and has engaged the suspension rope.

- Prohibit the use of repaired wire rope as suspension rope.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30016, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30018 Make sure wire suspension rope connections meet these requirements.**

**You must:**

- Only use eye splice thimbles connected with shackles or cover plates and bolts to join wire suspension ropes together.

- Make sure the load ends of wire suspension ropes are:
  - Equipped with proper size thimbles;

**AND**

- Secured by eye splicing or an equivalent means.

- Make sure all swaged attachments or spliced eyes on wire suspension rope have been made by either:

- The wire rope manufacturer;

**OR**

- A qualified person.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30018, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30020 Make sure wire rope clips are used properly.**

**You must:**

- Make sure, if wire rope clips are used on suspended scaffolds, such as on the suspension ropes or support lines, that:

- A minimum of three clips are installed;
- The distance between clips is at least six rope diameters;
- Clips are installed according to the manufacturer's recommendations.

- Retighten the clips to the manufacturer's recommendations after the initial loading.

- Inspect the clips and retighten them to the manufacturer's recommendations at the start of each work shift.

- Make sure U-bolt clips are not used at the point of suspension for any scaffold hoist.

- Make sure, if U-bolt clips are used, that:

- The U-bolt is placed over the dead end of the rope;

**AND**

- The saddle is placed over the live end of the rope.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30020, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-30022 Prevent swaying of two-point and multipoint suspension scaffolds.**

**You must:**

- Tie or use other means to keep two-point and multipoint suspension scaffolds from swaying, if an evaluation by a competent person determines it is necessary.

**Note:** Window cleaners' anchors **cannot** be used to secure scaffolds since they are not designed to withstand the load.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30022, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-30024 Use emergency escape and rescue devices appropriately.**

**You must:**

- Make sure devices whose sole function is to provide emergency escape and rescue are not used as working platforms.

**Note:** Systems which are designed to function both as suspended scaffolds and emergency systems may be used as working platforms.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30024, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-30026 Protect suspension ropes from heat or corrosive substances.**

**You must:**

- Shield suspension ropes from heat-producing processes.

- Make sure, when acids or other corrosive substances are used on a scaffold, that the suspension ropes are protected by at least one of the following:

- Shielding;

- Treating to protect the rope from the corrosive substances;

- Making the rope of material that the corrosive substance will not damage.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30026, filed 12/7/04, effective 3/1/05.]

(2007 Ed.)

### **WAC 296-874-30028 Take precautions while welding.**

**You must:**

- Do the following to protect employees while welding on suspended scaffolds:

- Use an insulated thimble to attach each suspension wire rope to its hanging support, such as a cornice hook or outrigger;

- Insulate excess suspension wire rope and any additional independent lines to prevent grounding;

- Cover the wire suspension rope with insulating material that extends at least four feet (1.2 m) above the hoist;

- Make sure any tail line that extends below the hoist is:
  - Insulated to prevent contact with the platform;

**AND**

- Guided or retained so it does not become grounded.

- Cover each hoist with an insulated protective cover;

- Connect the scaffold to the structure using a grounding conductor that:

- Is at least the size of the welding process work lead;

**AND**

- Is not in series with the welding process or the work piece.

- Shut off the welding machine if the scaffold grounding lead becomes disconnected;

- Make sure an active welding rod or an uninsulated welding lead is not allowed to contact the:

- Scaffold;

**OR**

- Scaffold suspension system.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30028, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-30030 Prohibit use of gasoline-powered equipment on suspended scaffolds.**

**You must:**

- Make sure gasoline-powered equipment is **not** used on suspended scaffolds.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30030, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-30032 Meet these requirements when using catenary scaffolds.**

**You must:**

- Make sure catenary scaffolds have:

- No more than one platform between consecutive vertical pickups;

**AND**

- No more than two platforms per scaffold.

- Make sure any platform that's supported by wire ropes has hook-shaped stops placed at each end of the platform that will prevent it from falling if one of the horizontal wire ropes breaks.

- Make sure wire ropes are:

- Continuous and without splices between anchors;

**AND**

- Not tightened to the point that putting a load on the scaffold will overstress them.

**Reference:** For specific fall protection requirements for employees on catenary scaffolds, go to WAC 296-874-20056.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30032, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30034 Meet these requirements when using float (ship) scaffolds.**

**You must:**

- Support the platform with at least two bearers.
- Make sure each bearer:
  - Projects at least six inches (15.2 cm) beyond the platform on both sides;

**AND**

- Is securely fastened to the platform.
- Make sure rope connections won't allow the platform to shift or slip.
- Make sure scaffolds that only have two ropes used with each float meet all of the following:
  - There are four rope ends that are securely fastened to overhead supports;
  - Each supporting rope is hitched around one end of the bearer, passed under the platform to the other end of the bearer, and hitched again;
  - There is enough rope at each end for the supporting ties.

**Reference:** For specific fall protection requirements for employees on float (ship) scaffolds, go to WAC 296-874-20056.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30034, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30036 Meet these requirements when using interior hung scaffolds.**

**You must:**

- Suspend the scaffold only from the roof structure or other structural member, such as ceiling beams.
  - Inspect the overhead supporting members and check to make sure they're strong enough before erecting the scaffold.
  - Connect suspension ropes and cables to the overhead supporting members by:
    - Shackles, clips, or thimbles;
- OR**
- Other means that meet equivalent criteria, such as strength and durability.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30036, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30038 Meet these requirements when using multilevel suspended scaffolds.**

**You must:**

- Equip scaffolds with additional independent support lines that meet all of the following:
  - There are the same number of support lines as there are connection points for the suspension ropes;
  - The support lines are equivalent in strength to the suspension ropes;
  - The support lines are rigged to support the scaffold if the suspension ropes fail.
- Make sure the independent support lines and the suspension ropes are not attached to the same points of anchorage.
- Attach platform supports directly to the support stirrup and not to another platform.

[Title 296 WAC—p. 3098]

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30038, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30040 Meet these requirements when using multipoint adjustable suspension scaffolds.**

**IMPORTANT:**

This requirement applies when using multipoint adjustable suspension scaffolds, stonemasons' multipoint adjustable suspension scaffolds, and masons' multipoint adjustable suspension scaffolds.

**You must:**

- Make sure masons' multipoint adjustable suspension scaffold connections are designed by an engineer experienced in designing this type of scaffold.
- Make sure bridges between two or more scaffolds meet all of the following:
  - The scaffolds were designed to be bridged;
  - The bridges are articulated;
  - The hoists are properly sized.
- Make sure passage from one platform to another, without using bridges, is done only when the platforms are:
  - At the same height;

**AND**

- Abutting.
  - Suspend scaffolds from:
    - Metal outriggers, brackets, wire rope slings, or hooks;
- OR**
- Other means that meet equivalent criteria, such as strength and durability.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30040, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30042 Meet these requirements when using needle beam scaffolds.**

**You must:**

- Install scaffold support beams on edge.
- Use ropes or hangers for scaffold supports:
  - One end of a needle beam scaffold may be supported by a permanent structural member.
    - Securely attach ropes to the needle beams.
    - Arrange the support connection to prevent the needle beam from rolling or becoming displaced.
    - Securely attach platform units to the needle beams with bolts or equivalent means.

**Note:** Cleats and overhang are not adequate means of attachment.  
**Reference:** For specific fall protection requirements for employees on needle beam scaffolds, go to WAC 296-874-20056.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30042, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30044 Meet these requirements when using single-point adjustable suspension scaffolds.**

**You must:**

- Make sure two scaffolds that have been combined to form a two-point adjustable suspension scaffold meet the requirements of the section. Make sure two-point adjustable suspension scaffolds (swing stages) meet these requirements, WAC 296-874-30046.
  - Make sure scaffolds, where the suspension rope between the scaffold and the suspension device is not vertical, meet all of the following:

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- The rigging has been designed by a qualified person;
- The scaffold is accessible to rescuers;
- The suspension rope is protected from chafing at any point where it changes direction;
- The scaffold is positioned so that swinging cannot bring the scaffold into contact with another surface.
- Make sure boatswain's chair tackle meets all of the following:
  - It consists of correct size ball bearing blocks or bushed blocks;
  - The blocks contain safety hooks;
  - The rope is properly eye spliced;
  - The rope is either:
    - First-grade manila rope that has a diameter of at least five-eighths inch (1.6 cm);
    - OR
    - Other rope that has equivalent characteristics, such as strength and durability.
  - Make sure boatswain's chair seat slings meet all of the following:
    - Are reeved through four corner holes in the seat;
    - Cross each other on the underside of the seat;
    - Are rigged to prevent slipping which could cause the seat to become out-of-level;
    - Are made from fiber, synthetic, or other rope which have:
      - A diameter of at least five-eighths inch (1.6 cm);
      - AND
      - Characteristics equivalent to first grade manila rope, such as strength, slip resistance, and durability.
    - Make sure the seat sling of boatswain's chairs used when a heat-producing process, such as gas or arc welding, is being conducted is at least three-eighths inch (1.0 cm) wire rope.
    - Securely fasten cleats to the underside of noncross-laminated wood boatswain's chairs to prevent the board from splitting.

**Reference:** For specific fall protection requirements for employees on single-point adjustable suspension scaffolds, go to WAC 296-874-20056.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30044, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-30046 Meet these requirements when using two-point adjustable suspension scaffolds (swing stages).**

**IMPORTANT:**

This section does not apply to two-point adjustable suspension scaffolds used as masons' or stonemasons' scaffolds.

**Reference:** For requirements for masons' or stonemasons' scaffolds, go to WAC 296-874-30040.

**You must:**

- Make sure platforms more than thirty-six inches (0.9 m) wide have been designed by a qualified person to prevent unstable conditions.
- Make sure platforms are one of the following:
  - Ladder-type;
  - Plank-type;
  - Beam-type;
  - Light-metal type.

- Make sure the design of light-metal type platforms have been tested and listed by a nationally recognized testing laboratory if they:
  - Have a rated capacity of seven hundred fifty pounds or less;

**OR**

- Have a length of forty feet (12.2 m) or less.
- Securely fasten the platform to the hangers (stirrups) using U-bolts or other means that satisfy the section titled, Make sure suspended scaffolds and scaffold components meet these strength requirements, WAC 296-874-30002.
- Make sure fiber or synthetic ropes are used with blocks that:
  - Consist of at least one double and one single block;

**AND**

- Have sheaves that fit the size of the rope used.
- Make sure employees move from one platform to another only when all of the following are met:
  - The platforms are at the same height;
  - The platforms are abutting;
  - Walk-through stirrups are used that have been specifically designed to allow employee passage.
  - Make sure two-point scaffolds that are bridged or otherwise connected together when being raised or lowered meet both of the following:
    - The bridge connections are articulated;
    - The hoists are properly sized.

**Reference:** For specific fall protection requirements for employees on two-point adjustable suspension scaffolds, go to WAC 296-874-20056.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-30046, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-400 Supported scaffolds.**

**Section contents:**

**Your responsibility:**

To meet these requirements when using supported scaffolds.

Make sure supported scaffolds and scaffold components meet strength requirements

WAC 296-874-40002.

Prevent supported scaffolds from tipping

WAC 296-874-40004.

Make sure supported scaffolds are properly supported

WAC 296-874-40006.

Provide safe access for persons erecting or dismantling supported scaffolds

WAC 296-874-40008.

Provide fall protection for persons erecting or dismantling supported scaffolds

WAC 296-874-40010.

Meet these requirements when moving mobile scaffolds

WAC 296-874-40012.

Meet these requirements when using bricklayers' square scaffolds (squares)

WAC 296-874-40014.

Meet these requirements when using crawling boards (chicken ladders)

WAC 296-874-40016.

Meet these requirements when using fabricated frame scaffolds (tubular welded frame scaffolds)

WAC 296-874-40018.

Meet these requirements when using integral prefabricated scaffold access frames

WAC 296-874-40020.

Meet these requirements when using form scaffolds and carpenter's bracket scaffolds

WAC 296-874-40022.

Meet these requirements when using horse scaffolds

WAC 296-874-40024.

Meet these requirements when using ladder jack scaffolds

WAC 296-874-40026.

Meet these requirements when using outrigger scaffolds

WAC 296-874-40028.

Meet these requirements when using pole scaffolds

WAC 296-874-40030.

Meet these requirements when using pump jack scaffolds

WAC 296-874-40032.

Meet these requirements when using repair bracket scaffolds

WAC 296-874-40034.

Meet these requirements when using roof bracket scaffolds

WAC 296-874-40036.

Meet these requirements when using step, platform, and trestle ladder scaffolds

WAC 296-874-40038.

Meet these requirements when using tube and coupler scaffolds

WAC 296-874-40040.

Meet these requirements when using window jack scaffolds

WAC 296-874-40042.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-4000, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-40002 Make sure supported scaffolds and scaffold components meet strength requirements.**

#### **You must:**

- Make sure each supported scaffold and scaffold component can support, without failure, the total of its own weight plus at least four times the maximum intended load applied or transmitted to it.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40002, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-40004 Prevent supported scaffolds from tipping.**

#### **You must:**

- Make sure supported scaffolds with a height to least base dimension ratio of greater than four to one are prevented from tipping by one or more of the following:

- Guying;

- Tying;

- Bracing;

- Other equivalent means.

**Note:** The least base dimension includes outriggers, if used.

#### **You must:**

- Install guys, ties, and braces where horizontal members support both the inner and outer legs of the scaffold.

- Install guys, ties, and braces:

- According to the scaffold manufacturer's recommendations;

**OR**

- At all points where the following horizontal and vertical planes meet:

- First vertical level at a height equal to four times the least base dimension;

- Subsequent vertical levels every:

- ◆ Twenty feet (6.1 m) or less for scaffolds having a width of three feet (0.91 m) or less;

- ◆ Twenty six feet (7.9 m) or less for scaffolds more than three feet (0.91 m) wide;

- Horizontally at:

- ◆ Each end of the scaffold;

**AND**

- ◆ Intervals of thirty feet (9.1 m) or less.

**Note:** The thirty-foot horizontal intervals are measured from one end of the scaffold to the other.

#### **You must:**

- Make sure the highest level of guys, ties, or braces is no further from the top of the scaffold than a distance equal to four times the least base dimension.

- Make sure scaffolds that have an eccentric load applied or transmitted to them, such as a cantilevered work platform, are prevented from tipping by one or more of the following:

- Guying;

- Tying;

- Bracing;

- Outriggers;

- Other equivalent means.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40004, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-40006 Make sure supported scaffolds are properly supported.**

#### **You must:**

- Make sure supported scaffold poles, legs, posts, frames, and uprights are:

- Plumb;

**AND**

- Braced to prevent swaying or displacement.

- Make sure supported scaffold poles, legs, posts, frames, and uprights, bear on base plates that rest on:

- Mudsills;

**OR**

- Other firm foundations such as concrete or dry, compacted soil.

- Make sure foundations are all of the following:

- Level;

- Sound;

- Rigid;

- Capable of supporting the loaded scaffold without settling or displacement.

**Note:** The condition of the foundation may change due to weather or other factors. If changes occur, the foundation needs to be evaluated by a competent person to make sure it will safely support the scaffold.

- Make sure unstable objects are not used:

- To support scaffolds or platform units;

**OR**

- As working platforms.
- Make sure mobile scaffolds meet these additional requirements:
  - Wheel and caster stems are pinned or otherwise secured in the scaffold legs or adjustment screws;
  - Wheels and casters are locked, or equivalent means are used, to prevent movement when the scaffold is being used;
  - Screw jacks or other equivalent means are used if it's necessary to level the work platform.
- Make sure front-end loaders and similar equipment used to support scaffold platforms have been specifically designed for such use by the manufacturer.

**Reference:** For requirements about powered industrial trucks, including forklifts that are used to support scaffold platforms, go to Powered industrial trucks, chapter 296-863 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40006, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40008 Provide safe access for persons erecting or dismantling supported scaffolds.**

**You must:**

- Provide a safe means of access for persons erecting or dismantling scaffolds if it is:
  - Feasible;
- AND**
- Does **not** create a greater hazard.
- Have a competent person determine the feasibility of providing safe access.
  - Make sure the determination is based on site conditions and the type of scaffold being erected or dismantled.
  - Install a hook-on or attachable ladder as soon as scaffold erection has progressed to a point where it can be safely installed and used.
  - Make sure crossbraces on tubular welded frame scaffolds are not used to access or egress from the scaffold.
  - Make sure the frames of tubular welded frame scaffolds that are used as climbing devices meet all of the following:
    - Create a usable ladder;
    - Provide good hand holds and foot space;
    - Have horizontal members that are all of the following:
      - Parallel;
      - Level;
      - Spaced not more than twenty two inches apart vertically.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40008, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40010 Provide fall protection for persons erecting or dismantling supported scaffolds.**

**You must:**

- Have a competent person determine the feasibility of providing fall protection for persons erecting or dismantling supported scaffolds.
  - Provide fall protection if the installation and use of fall protection is:
    - Feasible;
- AND**
- Does **not** create a greater hazard.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40010, filed 12/7/04, effective 3/1/05.]

(2007 Ed.)

**WAC 296-874-40012 Meet these requirements when moving mobile scaffolds.**

**You must:**

- Make sure, before a scaffold is moved, that employees on the scaffold are made aware of the move.
  - Apply manual force being used to move a scaffold:
    - As close to the base as practicable;
- AND**
- Within five feet (1.5 m) of the supporting surface.
- Make sure power systems used to propel mobile scaffolds have been designed for such use.
  - Make sure forklifts, trucks, similar motor vehicles, or add-on motors are not used to propel scaffolds unless the scaffold has been designed to be used with that type of propulsion system.
    - Stabilize scaffolds to prevent tipping when they're being moved.
      - Make sure a scaffold is not moved with employees riding on it unless all of the following are met:
        - The surface on which the scaffold is being moved is:
          - Within three degrees of level;
- AND**
- Free of pits, holes, and obstructions;
  - No employee is on any part of the scaffold which extends out beyond the wheels, casters, or other supports;
  - Outrigger frames, when used, are installed on both sides of the scaffold;
  - The power system, if used:
    - Applies the propelling force directly to the wheels;
- AND**
- Produces a speed of one foot per second (.3 mps) or less;
  - The height of the scaffold:
    - Is not more than two times the least base dimension;
- OR**
- The scaffold is designed and constructed to meet or exceed nationally recognized stability test requirements, such as those listed in ANSI/SIA A92.5, Boom-Supported Elevating Work Platforms, and ANSI/SIA A92.6, Self-Propelled Elevating Work Platforms.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40012, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40014 Meet these requirements when using bricklayers' square scaffolds (squares).**

**You must:**

- Reinforce wood scaffolds with gussets on both sides of each corner.
  - Make sure diagonal braces are installed:
    - On all sides of each square;
    - Between squares on the front and back sides of the scaffold;
    - Extending from the bottom of each square to the top of the next square.
  - Make sure scaffolds meet all of the following:
    - Are no more than three tiers high;
    - Are constructed and arranged so that each square rests directly above another square;
    - The upper tiers:
      - Stand on a continuous row of planks laid across the next lower tier;

[Title 296 WAC—p. 3101]

**AND**

■ Are nailed down or otherwise secured to prevent displacement.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40014, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40016 Meet these requirements when using crawling boards (chicken ladders).****You must:**

• Make sure crawling boards (chicken ladders) extend from the roof peak to the eaves when used for roof construction, repair, or maintenance.

• Secure crawling boards (chicken ladders) to the roof by using either:

– Ridge hooks;

**OR**

– Means that meet equivalent criteria, such as strength and durability.

**Reference:** There are specific fall protection requirements for employees using crawling boards (chicken ladders). Go to WAC 296-874-20058.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40016, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40018 Meet these requirements when using fabricated frame scaffolds (tubular welded frame scaffolds).****You must:**

• Make sure scaffolds over one hundred twenty-five feet (38.0 m) high above their base plates are:

– Designed by a registered professional engineer;

**AND**

– Constructed and loaded as specified in the design.

• Brace frames and panels using crossbraces, horizontal braces, diagonal braces, or a combination thereof to secure vertical members together laterally.

• Make sure the length of the crossbraces will:

– Automatically square and align the vertical members;

**AND**

– Make the scaffold plumb, level, and square.

• Secure all brace connections.

• Join frames and panels together vertically by using one of the following:

– Coupling pins;

– Stacking pins;

– Equivalent means.

• Use pins or other equivalent means to lock scaffold frames or panels together vertically where uplift may occur.

• Make sure brackets used to support cantilevered loads are all of the following:

– Seated with side-brackets parallel to the frames and end-brackets at ninety degrees to the frames;

– Not bent or twisted from these positions;

– Used only to support persons.

**Exemption:** Brackets may be used to support cantilevered loads other than personnel if the scaffold has been:

• Designed for other loads by a qualified engineer;

**AND**

• Built to withstand the tipping forces caused by those loads.

**You must:**

[Title 296 WAC—p. 3102]

• Leave existing platforms undisturbed until new frames have been set in place and braced, then move the platforms to the next level.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40018, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40020 Meet these requirements when using integral prefabricated scaffold access frames.****You must:**

• Make sure integral prefabricated scaffold access frames meet all of the following:

– Have been specifically designed and constructed to be used as ladder rungs;

– Have a rung length of at least eight inches (20 cm);

– Have a maximum spacing between rungs of sixteen and three quarters inches (43 cm);

– Are uniformly spaced within each frame section;

– Have rest platforms at least every twenty feet (6.1 m) on all supported scaffolds more than twenty-four feet (7.3 m) high.

**Note:** Nonuniform rung spacing caused by joining end frames together is allowed, provided the resulting spacing does not exceed sixteen and three quarters inches (43 cm).

**You must:**

• Make sure, when panels with rungs that are less than eleven and one-half inches long are used as work platforms, that employees use either:

– A positioning device;

**OR**

– A personal fall arrest system.

**Reference:** • For personal fall arrest system requirements in this chapter, go to WAC 296-874-20058.

• For construction activities, go to fall restraint and fall arrest, Part C-1, in safety standards for construction work, chapter 296-155 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40020, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40022 Meet these requirements when using form scaffolds and carpenter's bracket scaffolds.****You must:**

• Secure folding-type metal brackets that have been extended for use, with:

– Bolts;

**OR**

– Locking-type pins.

• Make sure wooden-bracket form scaffolds are an integral part of the form panel.

• Attach each bracket, other than those for wooden bracket-form scaffolds, to the supporting formwork or structure by using one or more of the following:

– Nails;

– A metal stud attachment device;

– Welding;

– Hooking over a secured structural supporting member, with the form wales either:

■ Bolted to the form;

**OR**

■ Secured by snap ties or tie bolts extending through the form and securely anchored.

– For carpenters' bracket scaffolds only, using a bolt extending through to the opposite side of the structure's wall.

(2007 Ed.)

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40022, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40024 Meet these requirements when using horse scaffolds.**

**You must:**

- Make sure horse scaffolds are not constructed or arranged higher than two tiers or ten feet (3.0 m), whichever is less.
  - Do all of the following if horses are arranged in tiers:
    - Place each horse directly over the horse in the tier below;
    - Nail down or otherwise secure the legs of each horse to prevent displacement;
    - Crossbrace each tier.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40024, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40026 Meet these requirements when using ladder jack scaffolds.**

**You must:**

- Make sure the platform height is not higher than twenty feet (6.1 m).
- Make sure ladder jacks are designed and constructed so they rest:
  - On the side rails and ladder rungs together;

**OR**

- Only on the rungs.
- Make sure ladder jacks that rest on rungs only have a bearing area that includes a length of at least ten inches (25.4 cm) on each rung.
  - Make sure ladders used to support ladder jacks are:
    - Type I (two hundred fifty pound rated capacity) or Type IA (300 pound rated capacity);

**AND**

- Are placed, fastened, or equipped with devices to prevent slipping.

**Note:** Ladders with a duty rating or weight capacity greater than a Type I ladder (250 pounds) satisfy the requirement to use a Type I or Type IA ladder.

**You must:**

- Make sure job-made ladders are not used to support ladder jack scaffolds.
- Make sure scaffold platforms are not bridged together.

**Reference:**

- There are specific fall protection requirements for employees using ladder jack scaffolds. Go to WAC 296-874-20056.
- Requirements for portable and fixed ladders are found in chapter 296-876 WAC, Ladders, portable and fixed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-874-40026, filed 7/24/06, effective 12/1/06; 05-01-054, § 296-874-40026, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40028 Meet these requirements when using outrigger scaffolds.**

**You must:**

- Make sure outrigger scaffolds and scaffold components are:
    - Designed by a registered professional engineer;
- AND**
- Constructed and loaded as specified in the design.

(2007 Ed.)

- Make sure the part of the outrigger beam from the fulcrum point to the inboard end (farthest point of anchorage) is at least one and one-half times longer than the part from fulcrum point to the outboard end (the platform side).

- Place I-beam or channel shaped outrigger beams so that the web section is vertical.

- Make sure the fulcrum point of outrigger beams rests on secure bearings at least six inches (15.2 cm) in each horizontal dimension.

- Make sure outrigger beams are:

- Secured in place to prevent movement;

**AND**

- Securely braced at the fulcrum point against tipping.

- Securely anchor the inboard ends of outrigger beams by using one or both of the following:

- Braced struts bearing against sills that are in contact with the overhead beams or ceiling;

**OR**

- Tension members secured to the floor joists below.

- Securely brace the entire supporting structure to prevent any horizontal movement.

- Nail, bolt, or otherwise secure platform units to the outriggers to prevent platform displacement. Platform units must extend to within three inches of the building wall.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40028, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40030 Meet these requirements when using pole scaffolds.**

**You must:**

- Make sure pole scaffolds over sixty feet high are:

- Designed by a registered professional engineer;

**AND**

- Constructed and loaded as specified in the design.

- Leave existing platforms undisturbed until new bearers have been set in place and braced before moving the platforms to the new level.

- Install bracing on double-pole scaffolds as follows:

- Crossbracing between the inner and outer sets of poles;
- Diagonal bracing in both directions across the entire outside face of the scaffold;

- Diagonal bracing in both directions across the entire inside face of scaffolds that are used to support loads equivalent to a uniformly distributed load of fifty pounds (222 kg) or more per square foot (929 square cm).

- Install diagonal bracing on single pole scaffolds in both directions across the entire outside face of the scaffold.

- Make sure runners meet all of the following:

- Are installed on edge;
- Extend over a minimum of two poles;
- Are supported by bearing blocks securely attached to the poles.

- Make sure bearers are:

- Installed on edge;

**AND**

- Extend a minimum of three inches (7.6 cm) over the outside edges of runners.

- Make sure runners, bearers, and braces are not spliced between poles.

- Make sure wood poles that are spliced together meet both of the following:

- Are installed on edge;
- Extend over a minimum of two poles;
- Are supported by bearing blocks securely attached to the poles.

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– The ends of the poles at the splice:

■ Are square;

AND

■ The upper section rests squarely on the lower section.

– Wood splice plates are provided that meet all of the following:

■ Are installed on at least two adjacent sides;

■ Extend at least two feet (0.6 m) on either side of the splice;

■ Overlap the abutted ends equally;

■ Have the same cross-sectional areas as the pole.

**Note:** Splice plates of material other than wood may be used if they are of equivalent strength.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40030, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-40032 Meet these requirements when using pump jack scaffolds.**

#### **You must:**

• Make sure pump jack brackets, braces, and accessories are made from metal plates and angles.

• Make sure pump jack brackets have two positive gripping mechanisms to prevent any failure or slippage.

• Secure poles to the structure using rigid triangular bracing or the equivalent located at all of the following:

– Top;

– Bottom;

– Other points on the pole as necessary.

• Do both of the following when the pump jack has to pass bracing that's already installed:

– Install an additional brace approximately four feet (1.2 m) above the brace to be passed;

– Leave it in place until:

■ The pump jack has been moved;

AND

■ The original brace is reinstalled.

• Make sure work benches are not used as scaffold platforms.

**Note:** A work bench may be used as a toprail only if it meets the toprail requirements in Make sure guardrail systems meet these requirements, WAC 296-874-20064.

#### **You must:**

• Make sure wood poles used with pump jack scaffolds are:

– Straight grained;

AND

– Free of shakes, large loose or dead knots, and other defects which might impair strength.

• Make sure wood poles that are constructed of two continuous lengths are joined together with the seam parallel to the bracket.

• Install a mending plate at all splices to develop the full strength of the member when splicing two by fours together to make a pole.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40032, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-40034 Meet these requirements when using repair bracket scaffolds.**

#### **You must:**

• Make sure brackets are all of the following:

– Secured in place by at least one wire rope that's at least one-half inch (1.27 cm) in diameter;

– Attached to the securing wire rope by a positive locking device, or equivalent, that will prevent the bracket from being unintentionally detached from the rope;

– Provided with a shoe, heel block, foot, or a combination that:

■ Is located at the contact point between the supporting structure and the bottom of the bracket;

AND

■ Will prevent lateral movement of the bracket.

• Secure the platforms to the brackets in a way that prevents:

– The platforms from separating from the brackets;

AND

– The platforms or brackets from moving on a completed scaffold.

• Make sure wire rope placed around the structure to provide a safe anchorage for personal fall arrest systems used by employees erecting or dismantling scaffolds:

– Is at least five-sixteenths inch (0.8 cm) in diameter;

– Provides an anchorage that meets the requirements of

WAC 296-874-20058.

■ For construction activities, go to fall restraint and fall arrest, Part C-1, in the safety standards for construction work, chapter 296-155 WAC.

• Make sure each wire rope used for securing brackets in place or as an anchorage for personal fall arrest systems is all of the following:

– Protected from damage due to contact with edges, corners, protrusions, or other parts of the supporting structure or scaffold components;

– Tensioned by a turnbuckle or equivalent means. Turnbuckles must be:

■ At least one inch (2.54 cm) in diameter;

AND

■ Connected to the other end of its rope by an eye splice thimble that's sized appropriate to the turnbuckle.

– **Not** used with U-bolt wire rope clips.

• Make sure materials are not dropped to the outside of the supporting structure.

• Erect the scaffold by progressing around the structure in only one direction.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40034, filed 12/7/04, effective 3/1/05.]

### **WAC 296-874-40036 Meet these requirements when using roof bracket scaffolds.**

#### **You must:**

• Make sure scaffold brackets meet all of the following:

– Are constructed to fit the pitch of the roof;

– Provide a level support for the platform;

– Are anchored in place by nails.

**Note:** If it's not practical to use nails to anchor brackets, secure them in place with first grade manila rope of at least three-quarters inch (1.9 cm) diameter, or equivalent.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40036, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40038 Meet these requirements when using step, platform and trestle ladder scaffolds.****You must:**

- Make sure ladders used to support step, platform, and trestle ladder scaffolds are:

- Type I (250 pound rated capacity) or Type IA (300 pound rated capacity);

**AND**

- Placed, fastened, or equipped with devices to prevent slipping.

**Note:** Ladders with a duty rating or weight capacity greater than a Type I ladder (250 pounds) satisfy the requirement to use a Type I or Type IA ladder.

**You must:**

- Make sure job-made ladders are not used to support step, platform, and trestle ladder scaffolds.

**Reference:**

- There are specific fall protection requirements for employees using ladder jack scaffolds. Go to WAC 296-874-20056.
- Requirements for portable and fixed ladders are found in chapter 296-876 WAC, Ladders, portable and fixed.

**You must:**

- Make sure scaffold platforms are not placed higher than the second highest rung or step of the ladder supporting the platform.

- Make sure scaffold platforms are not bridged together.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-874-40038, filed 7/24/06, effective 12/1/06; 05-01-054, § 296-874-40038, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40040 Meet these requirements when using tube and coupler scaffolds.****You must:**

- Make sure tube and coupler scaffolds over one hundred twenty-five feet high are:

- Designed by a registered professional engineer;

**AND**

- Constructed and loaded as specified in the design.

- Leave existing platforms undisturbed until new bearers have been set in place and braced before moving the platforms to the new level.

- Install crossbracing across the width of the scaffold that meets all of the following:

- Bracing is installed at:

- Each end of the scaffold;

**AND**

- At least at every third set of posts horizontally and every fourth runner vertically.

- Bracing extends diagonally from the:

- Outer posts or runners upwards to the next inner posts or runners;

**AND**

- Inner posts or runners upwards to the next outer posts or runners.

- Install building ties:

- At the bearer levels between the crossbracing;

**AND**

- At locations specified in WAC 296-874-40004.

- Install longitudinal bracing on straight run scaffolds as follows:

- Diagonally in both directions across the inner and outer rows of posts;

(2007 Ed.)

- From the base of the end posts upward to the top of the scaffold at approximately a forty-five degree angle;

- As close as possible to the intersection of the bearer and post or runner and post;

- If the scaffold is longer than it is tall, repeat the bracing beginning at every fifth post;

- If the scaffold is taller than its length, install the bracing:

- From the base of the end posts upward to the opposite end posts;

**AND**

- In alternating directions until reaching the top of the scaffold.

- Attach bracing to the runners as close to the post as possible, if bracing can't be attached to the post.

- Make sure bearers meet all of the following:

- Are installed transversely between posts;

- If the bearer is coupled to the post, have the inboard coupler bear directly on the runner coupler;

- If the bearer is coupled to the runners, have the couplers as close to the posts as possible;

- Extend bearers beyond the posts and runners;

- Provide full contact with the coupler;

- The bottom bearers are located as close to the base as possible.

- Make sure runners meet all of the following:

- Are installed along the length of the scaffold;

- Are located on both the inside and outside posts at the same height;

- Are interlocked on straight runs to form continuous lengths and are coupled to each post;

- The bottom runners are located as close to the base as possible.

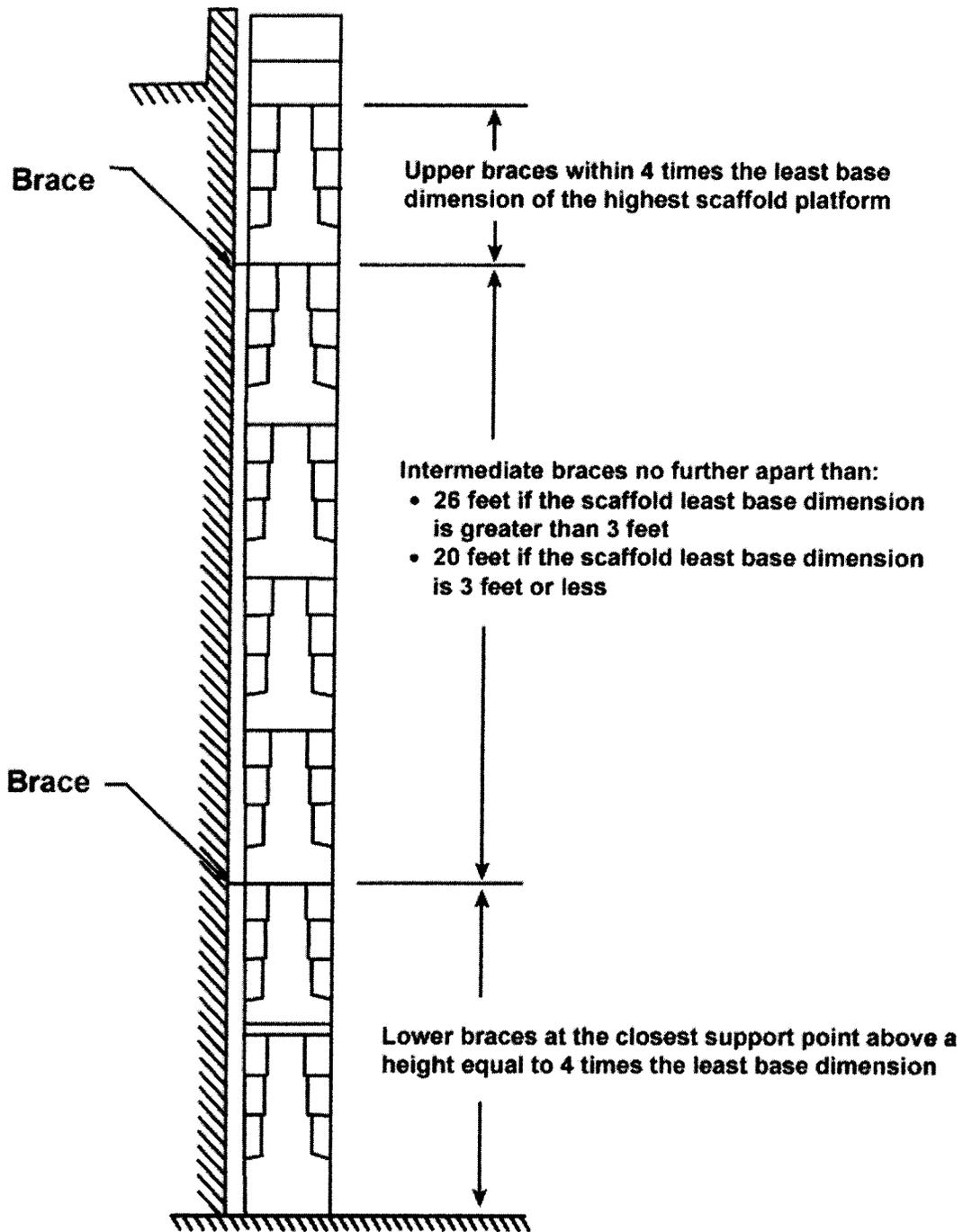
**Note:** Tube and coupler guardrails and midrails installed on outside posts can be used in lieu of outside runners.

**You must:**

- Make sure couplers are made of a structural metal, such as drop-forged steel, malleable iron, or structural grade aluminum.

- Prohibit using couplers made of gray cast iron.

Bracing – Tube and Coupler Scaffold



[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40040, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-40042 Meet these requirements when using window jack scaffolds.****You must:**

- Make sure window jack scaffolds meet all of the following:
  - Are securely attached to the window opening;
  - Are used for working only at the window opening the jack is placed through;
  - Are not used:
    - To support planks placed between one window jack and another;
- OR**
- As any other element of scaffolding.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-40042, filed 12/7/04, effective 3/1/05.]

**WAC 296-874-500 Definitions.**

**Adjustable suspension scaffold** a suspended scaffold equipped with one or more hoists that can be operated by employees on the scaffold.

**Bearer** a horizontal scaffold member (which may be supported by ledgers or runners) upon which the scaffold platform rests and which joins scaffold uprights, posts, poles, and similar members.

**Boatswain's chair** a single-point adjustable suspended scaffold consisting of a seat or sling designed to support one employee in a sitting position.

**Brace** a rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

**Bricklayers' square scaffold** a supported scaffold composed of framed squares which support a platform.

**Carpenters' bracket scaffold** a supported scaffold consisting of a platform supported by brackets attached to building or structural walls.

**Catenary scaffold** a suspended scaffold consisting of a platform supported by two essentially horizontal and parallel ropes attached to structural members of a building or other structure. Additional support may be provided by vertical pickups.

**Cleat** a structural block used at the end of a platform to prevent the platform from slipping off its supports. Cleats are also used to provide footing on sloped surfaces such as access ramps.

**Competent person** someone who:

- Is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees;

**AND**

- Has the authority to take prompt corrective measures to eliminate them.

**Coupler** a device for locking together the tubes of a tube and coupler scaffold.

**Crawling board (chicken ladder)** a supported scaffold consisting of a plank with cleats spaced and secured to provide footing, for use on sloped surfaces such as roofs.

**Double-pole (independent pole) scaffold** a supported scaffold consisting of one or more platforms resting on cross beams (bearers) supported by ledgers and a double row of uprights independent of support (except ties, guys, braces) from any structure.

**Equivalent** alternative design, material or method to protect against a hazard. You have to demonstrate it provides an equal or greater degree of safety for employees than the method, material or design specified in the rule.

**Exposed power lines** electrical power lines which are accessible to and may be contacted by employees. Such lines do not include extension cords or power tool cords.

**Eye or eye splice** a loop at the end of a wire rope.

**Fabricated frame scaffold (tubular welded frame scaffold)** a scaffold consisting of platforms supported on fabricated frames with integral posts, horizontal bearers, and intermediate members.

**Failure** load refusal, breaking, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

**Float (ship) scaffold** a suspended scaffold consisting of a braced platform resting on two parallel bearers and hung from overhead supports by ropes of fixed length.

**Form scaffold** a supported scaffold consisting of a platform supported by brackets attached to formwork.

**Guardrail system** a vertical barrier, consisting of, but not limited to, top rails, midrails, and posts, erected to prevent employees from falling off a scaffold platform or walkway.

**Handrails (ladder stands)** a rail connected to a ladder stand running parallel to the slope and/or top step.

**Hoist** a manual or power-operated mechanical device to raise or lower a suspended scaffold.

**Horse scaffold** a supported scaffold consisting of a platform supported by construction horses (saw horses). Horse scaffolds constructed of metal are sometimes known as trestle scaffolds.

**Independent pole scaffold** (see double pole scaffold).

**Interior hung scaffold** a suspended scaffold consisting of a platform suspended from the ceiling or roof structure by fixed length supports.

**Ladder jack scaffold** a supported scaffold consisting of a platform resting on brackets attached to ladders.

**Ladder stand** a mobile, fixed-size, self-supporting ladder consisting of a wide flat tread ladder in the form of stairs.

**Landing** a platform at the end of a flight of stairs.

**Large area scaffold** a pole scaffold, tube and coupler scaffold, system scaffold, or fabricated frame scaffold erected over substantially the entire work area. For example: A scaffold erected over the entire floor area of a room.

**Lean-to scaffold** a supported scaffold which is kept erect by tilting it toward and resting it against a building or structure.

**Ledger** (see runner).

**Lifeline** a component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline). It serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**Lower levels** areas below the level where the employee is located and to which an employee can fall. Such areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

**Masons' adjustable supported scaffold** (see self-contained adjustable scaffold).

**Masons' multipoint adjustable suspension scaffold** a continuous run suspended scaffold designed and used for masonry operations.

**Maximum intended load** the total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

**Midrail** a rail, approximately midway between the toprail of a guardrail system and the platform, and secured to the uprights erected along the exposed sides and ends of a platform.

**Mobile scaffold** supported scaffold mounted on casters or wheels.

**Multilevel suspended scaffold** a two-point or multi-point adjustable suspension scaffold with a series of platforms at various levels resting on common stirrups.

**Multipoint adjustable suspension scaffold** a suspended scaffold consisting of a platform(s) which is suspended by more than two ropes from overhead supports and equipped with means to raise and lower the platform to desired work levels.

**Needle beam scaffold** a suspended scaffold which has a platform supported by two bearers (needle beams) suspended from overhead supports.

**Outrigger** a structural member of a supported scaffold which increases the base width of a scaffold. This provides support for and increases the stability of the scaffold.

**Outrigger beam (suspended and supported)** the structural member of a suspended scaffold or outrigger scaffold which provides support for the scaffold by extending the scaffold point of attachment to a point out and away from the structure or building.

**Outrigger scaffold** a supported scaffold consisting of a platform resting on outrigger beams which projects beyond the wall or face of the building or structure. The inboard ends of the outrigger beams are secured inside the building or structure.

**Overhand bricklaying** the process of laying bricks and masonry so that the surface of the wall is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. It includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

**Personal fall arrest system** a system used to arrest an employee's fall. It consists of an anchorage, connectors, and body harness and may also include a lanyard, deceleration device, lifeline, or combinations of these.

**Platform** a work surface used in scaffolds, elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

**Pole scaffold** (see single-pole scaffold and double (independent) pole scaffold).

**Pump jack scaffold** a supported scaffold consisting of a platform supported by vertical poles and movable support brackets.

**Qualified person** a person who has successfully demonstrated the ability to solve problems relating to the subject matter, work, or project, either by:

- Possession of a recognized degree, certificate, or professional standing;

OR

- Extensive knowledge, training and experience.

**Rated load** the manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

**Repair bracket scaffold** a supported scaffold consisting of a platform supported by brackets. The brackets are secured in place around the circumference or perimeter of a chimney, stack, tank or other supporting structure by one or more wire ropes placed around the supporting structure.

**Roof bracket scaffold** a supported scaffold used on a sloped roof. It consists of a platform resting on angular-shaped supports so that the scaffold platform is level.

**Runner (ledger)** the lengthwise horizontal spacing or bracing member which may support the bearers.

**Scaffold** a temporary elevated platform, including its supporting structure and anchorage points, used for supporting employees or materials.

**Self-contained adjustable scaffold** a combination supported and suspended scaffold consisting of an adjustable platform mounted on an independent supporting frame, not a part of the object being worked on, which is equipped with a means to raise and lower the platform. Such systems include rolling roof rigs, rolling outrigger systems, and some masons' adjustable supported scaffolds.

**Shore scaffold** a supported scaffold which is placed against a building or structure and held in place with props.

**Single-point adjustable suspension scaffold** a suspended scaffold consisting of a platform suspended by one rope from an overhead support and equipped with means to permit the movement of the platform to desired work levels.

**Single-pole scaffold a supported scaffold** consisting of platforms resting on bearers, the outside ends of which are supported on runners secured to a single row of posts or uprights, and the inner ends of which are supported on or in a structure or building wall.

**Stair tower (scaffold stairway/tower)** a tower comprised of scaffold components which contains internal stairway units and rest platforms. These towers are used to provide access to scaffold platforms and other elevated points such as floors and roofs.

**Stall load** the load at which the prime mover of a power-operated hoist stalls or the power to the prime mover is automatically disconnected.

**Step, platform, and trestle ladder scaffold** a platform resting directly on the rungs of a step, platform, or trestle ladder.

**Stilts** a pair of poles or similar supports with raised footrests, used to permit walking above the ground or working surface.

**Stonesetters' multipoint adjustable suspension scaffold** a continuous run suspended scaffold designed and used for stonesetters' operations.

**Supported scaffold** one or more platforms supported by rigid means such as outrigger beams, brackets, poles, legs, uprights, posts, or frames.

**Suspended scaffold** one or more platforms suspended from an overhead structure by ropes or other nonrigid means.

**System scaffold** a scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals that can be interconnected at predetermined levels.

**Toeboard (scaffold)** a barrier erected along the exposed sides and ends of a scaffold platform at platform level to prevent material, tools, and other loose objects from falling from the platform.

**Top plate bracket scaffold** a scaffold supported by brackets that hook over or are attached to the top of a wall. This type of scaffold is similar to carpenters' bracket scaffolds and form scaffolds.

**Tube and coupler scaffold** a scaffold consisting of platforms supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

**Tubular welded frame scaffold** (see fabricated frame scaffold).

**Tubular welded sectional folding scaffold** a sectional, folding metal scaffold either of ladder frame or inside stairway design. It is substantially built of prefabricated welded sections, which consist of end frames, platform frame, inside inclined stairway frame and braces, or hinged connected diagonal and horizontal braces. It can be folded into a flat package when the scaffold is not in use.

**Two-point suspension scaffold (swing stage)** a suspended scaffold consisting of a platform supported by hangers (stirrups), suspended by two ropes from overhead supports, and equipped with a means to permit the raising and lowering of the platform to desired work levels.

**Unstable objects** items whose strength, configuration, or lack of stability may allow them to become dislocated and shift and therefore may not properly support the loads imposed on them. Unstable objects do not constitute a safe base support for scaffolds, platforms, or employees. Examples include, but are not limited to, barrels, boxes, loose brick, and concrete blocks.

**Vertical pickup** a rope used to support the horizontal rope in a catenary scaffold.

**Walkway (scaffold)** part of a scaffold used only for access and not as a working level.

**Window jack scaffold** a platform resting on a bracket or jack that projects through a window opening.

**Work level** the elevated platform, used for supporting workers and their materials.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-01-054, § 296-874-500, filed 12/7/04, effective 3/1/05.]

## Chapter 296-876 WAC

### LADDERS, PORTABLE AND FIXED

#### WAC

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296-876-70010	Inspection and repair.
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296-876-80005	Designed load.
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296-876-900	Definitions.

### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-876-50005	Training. [Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-50005, filed 10/4/05, effective 1/1/06.] Repealed by 06-16-020, filed 7/24/06, effective 12/1/06. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.
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**WAC 296-876-100 Scope.** This chapter applies to portable and fixed ladders, including job-made wooden ladders.

**Exemption:** This chapter does not apply to:

- Portable ladders used by the fire services for fire combat that are covered by Safety standards for fire fighters, chapter 296-305 WAC;
- Agriculture activities covered by Safety standards for agriculture, chapter 296-307 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-100, filed 7/24/06, effective 12/1/06; 05-20-068, § 296-876-100, filed 10/4/05, effective 1/1/06.]

### WAC 296-876-150 Training—Section contents.

#### Your responsibility:

To train employees who use ladders.

Training.

WAC 296-876-15005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-22-024, § 296-876-150, filed 10/24/06, effective 12/1/06.]

### WAC 296-876-15005 Training.

#### You must:

- Train employees to recognize ladder hazards and the procedures to minimize these hazards.
- Have a competent person train employees that use ladders in at least the following topics:
  - The proper construction, use, placement, and care in handling ladders.

[Title 296 WAC—p. 3109]

- The maximum intended load capacities of ladders that are used.
- The requirements of this chapter.
  - Retrain employees as necessary to make sure they know and understand the content of the original training.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-22-024, § 296-876-15005, filed 10/24/06, effective 12/1/06.]

**WAC 296-876-200 Design and construction—Section contents.**

**Your responsibility:**

To make sure portable ladders meet design and construction requirements.

Design and construction  
WAC 296-876-20005.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-200, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-20005 Design and construction.**

**IMPORTANT:**

Design and construction requirements of this section do not apply to special purpose ladders.

**Definition:**

A *special purpose ladder* is a portable ladder that is made by modifying or combining design or construction features of the general-purpose types of ladders in order to adapt the ladder to special or specific uses.

**You must:**

- Make sure portable ladders and job-made wooden ladders manufactured **on or after January 1, 2006**, meet the design and construction requirements and specifications of the appropriate American National Standards Institute (ANSI) standard:
  - ANSI A14.1-2000, American National Standard for Ladders-Portable Wood-Safety Requirements.
  - ANSI A14.2-2000, American National Standard for Ladders-Portable Metal-Safety Requirements.
  - ANSI A14.5-2000, American National Standard for Ladders-Portable Reinforced Plastic-Safety Requirements.
  - ANSI A14.4-2002, American National Standard Safety Requirements for Job-Made Wooden Ladders.
- Make sure portable ladders manufactured **before January 1, 2006**, meet the design and construction requirements and specifications of the appropriate ANSI standard in effect on the date of manufacture:
  - ANSI A14.1, American National Standard for Ladders-Portable Wood-Safety Requirements.
  - ANSI A14.2, American National Standard for Ladders-Portable Metal-Safety Requirements.
  - ANSI A14.5, American National Standard for Ladders-Portable Reinforced Plastic-Safety Requirements.

**Note:** A commercially manufactured portable ladder should have a label indicating it meets the requirements of the ANSI standard. If in doubt, check with the manufacturer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-20005, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-300 Ladder care—Section contents.**

**Your responsibility:**

To make sure portable ladders are inspected, maintained, stored and transported properly.

[Title 296 WAC—p. 3110]

- Condition and inspection  
WAC 296-876-30005.
- Repair  
WAC 296-876-30010.
- Storage  
WAC 296-876-30015.
- Transport  
WAC 296-876-30020.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-300, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-30005 Condition and inspection.**

**You must:**

- Keep portable ladders in good, usable condition. Good, usable condition includes, but is not limited to:
    - Joints between the steps or rungs and the side rails are tight.
    - Rungs, cleats, or steps are not bent, broken, or missing.
    - Side rails are not bent, broken, or split.
    - All bolts and rivets are in place and secure.
    - Hardware, fittings and accessories are securely attached and working properly.
    - Ropes are not frayed or badly worn.
    - Moveable parts operate freely without binding or excessive play.
    - Safety feet and other auxiliary equipment are not excessively worn.
    - Metal components are not corroded.
    - There are no other faulty or defective components.
  - Make sure wood ladders are not coated with an opaque covering except for the minimum amount necessary for identification and warning information which may be placed on one face only of a side rail.
    - Have a competent person inspect a ladder:
      - When required by Table 1, Ladder Inspection Criteria;
- AND**
- After any other occurrence that could affect safe use.
  - Make sure any ladder with structural damage or other hazardous defect is:
    - Marked to identify it as defective or tagged with "do not use" or similar language;
- AND**
- Removed from service.
- Note:** Ladders subjected to certain acids or alkali materials may experience chemical corrosion and a reduction in strength. Consult the manufacturer or a qualified person prior to use.

**Table 1  
Ladder Inspection Criteria**

When the ladder is:	Do the following:
First placed into service and periodically while in service	<ul style="list-style-type: none"> <li>• Inspect the ladder for visible defects, including, but not limited to:                             <ul style="list-style-type: none"> <li>- Working parts;</li> </ul> </li> <li><b>AND</b></li> <li>- Rung or step connections to the side rails.</li> </ul>

When the ladder is:	Do the following:
Damaged by impact or tips over	<ul style="list-style-type: none"> <li>• Visually inspect the ladder for:                             <ul style="list-style-type: none"> <li>– Dents, bends, cracks or splits</li> </ul> </li> <li>• Check:                             <ul style="list-style-type: none"> <li>– Rung or step connections to the side rails.</li> <li>– Hardware connections.</li> <li>– Rivets for shear damage.</li> <li>– All other components.</li> </ul> </li> </ul>
Exposed to excessive heat such as a fire	<ul style="list-style-type: none"> <li>• Visually inspect the ladder for damage.</li> <li>• Test for deflection and strength characteristics using the "in-service use tests" contained in the appropriate ANSI.</li> </ul> <p><b>Exemption:</b> Job-made wooden ladders are not to be subjected to load or impact tests. Those tests may weaken lumber components or fasteners, causing hidden damage that could result in sudden failure during use.</p>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-30005, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-30010 Repair.**

**You must:**

- Make sure repairs restore the ladder to a condition meeting its original design criteria.
- Prohibit repairs to a defective side rail.

**Note:** A commercially manufactured ladder with a defective side rail cannot be repaired by the user. Side rail repair can only be done by the manufacturer.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-30010, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-30015 Storage.**

**You must:**

- Make sure material is not put on ladders in storage.

**Note:**

- Store portable ladders on racks designed to protect them when not in use. The racks should have enough supporting points to prevent the ladder from sagging.
- Do not store wood ladders near sources of heat, moisture, or dampness.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-30015, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-30020 Transport.**

**You must:**

- Properly support ladders while transporting them on vehicles.
- Make sure ladders transported in a truck rack are positively secured in a fixed position that prevents chafing or abrasion.

(2007 Ed.)

**Note:** Securing the ladder to each support point will greatly reduce damage due to road shock.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-30020, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-400 Use—Section contents.**

**Your responsibility:**

- To use portable ladders safely.
- Designed use
- WAC 296-876-40005.
- Workplace activities or traffic
- WAC 296-876-40010.
- Support
- WAC 296-876-40015.
- Set-up
- WAC 296-876-40020.
- Climbing and descending
- WAC 296-876-40025.
- Getting on and off ladders at upper levels
- WAC 296-876-40030.
- Exposed electrical hazards
- WAC 296-876-40035.
- Persons on ladders
- WAC 296-876-40040.
- Multisection ladders
- WAC 296-876-40045.
- Self-supporting ladders
- WAC 296-876-40050.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-400, filed 10/4/05, effective 1/1/06.]

**WAC 296-876-40005 Designed use.**

**You must:**

- Use ladders only for their intended purpose.

**Note:** Unless specifically recommended by the manufacturer, do not use a ladder as a:

- Brace.
- Skid.
- Lever.
- Guy or gin pole.
- Gangway.
- Platform.
- Scaffold plank.
- Material hoist.

**You must:**

- Make sure not to overload ladders. Do not exceed either the:
  - Maximum intended load;
  - OR
  - Manufacturer’s rated capacity.

**Definitions:**

- The *maximum intended load* is the total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a ladder or ladder component at any one time.
- **Ladder type.** The designation that identifies the maximum intended load (working load) of the ladder. Ladder types are as follows:

Duty Rating	Ladder Type	Use	Maximum Intended Load (Pounds)
Extra Heavy-Duty	IA	Industry, utilities, contractors	300
Heavy-Duty	I	Industry, utilities, contractors	250
Medium-Duty	II	Painters, offices, light maintenance	225
Light-Duty	III	General household use	200

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40005, filed 10/4/05, effective 1/1/06.]

#### WAC 296-876-40010 Workplace activities or traffic.

##### You must:

- Protect ladders that are set-up in a location where they could be displaced by workplace activities or traffic by either:

- Securing the ladder to prevent accidental displacement;

##### OR

- Using a barricade to keep the activities or traffic away from the ladder.

- Protect ladders that are set-up in front of doors that open towards the ladder by doing at least one of the following:

- Block the door open.
- Lock the door.
- Guard the door to keep it from opening into the ladder.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40010, filed 10/4/05, effective 1/1/06.]

#### WAC 296-876-40015 Support.

##### You must:

- Place the ladder either:
- With a secure footing on a firm, level support surface;

##### OR

- Secure the ladder to prevent accidental displacement.

- Make sure a ladder is not placed on ice, snow, or other slippery surface unless the ladder is prevented from accidental displacement by either:

- Securing it;

##### OR

- Providing the ladder with slip-resistant feet.

**Note:** Slip-resistant feet are not a substitute for care in placing, lashing, or holding a ladder that is used on a slippery surface.

##### You must:

- Make sure ladders are not placed on boxes, barrels, or other unstable bases to obtain additional height.

- Place a straight ladder so the side rails are equally supported by the top support, unless the ladder is equipped with a single support attachment.

- Make sure the top support of the ladder is reasonably rigid and able to support the load.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40015, filed 10/4/05, effective 1/1/06.]

[Title 296 WAC—p. 3112]

#### WAC 296-876-40020 Set-up.

##### You must:

- Set up nonself-supporting ladders at a safe angle. The ladder is set at the proper angle when the horizontal distance from the top support to the foot of the ladder is approximately one-quarter the working length of the ladder.

- Set up job-made ladders with spliced side rails so that the horizontal distance from the top support to the foot of the ladder is not greater than one-eighth the working length of the ladder.

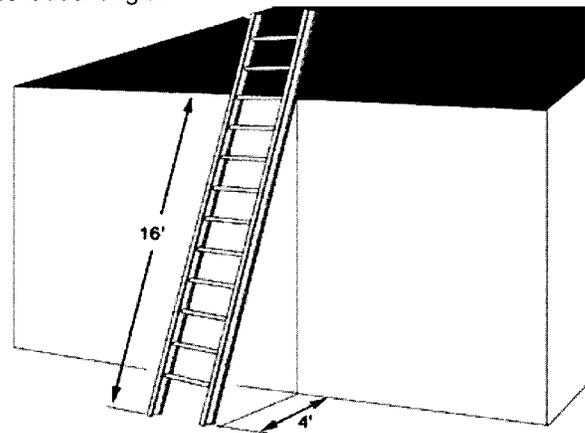
##### Definition:

The *working length* of a nonself-supporting ladder is the length, measured along the rails, from the base support point of the ladder to the point of bearing at the top.

#### Safe Ladder Angle

##### Note:

Safe ladder angle.



[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40020, filed 10/4/05, effective 1/1/06.]

#### WAC 296-876-40025 Climbing and descending.

##### You must:

- Have both hands free to hold on to the ladder.
- Face the ladder when climbing or descending.
- Keep ladders free of oil, grease, or other slippery materials.

- Keep the area around the top and bottom of ladders clear.

- Make sure single-rail ladders are not used.

##### Definition:

A *single-rail ladder* is a portable ladder with crosspieces mounted on a single rail.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40025, filed 10/4/05, effective 1/1/06.]

#### WAC 296-876-40030 Getting on and off ladders at upper levels.

##### You must:

- Make sure a ladder used to access an upper level has the side rails extended at least three feet (.9 m) above the landing surface if the ladder length permits.

- Do the following if a ladder used to access an upper level is not long enough to obtain a three-foot side rail extension above the landing surface:

- Secure the ladder at the top to a rigid support that will not deflect.
- Provide a grasping device, such as a grabrail, to assist in mounting and dismounting the ladder.
- Make sure the ladder deflection under a load would not, by itself, cause it to slip off its support.
  - Make sure, if two or more separate ladders are used to reach an elevated work area, that the ladders are offset with a platform or landing between them.

**Exemption:** A platform or landing is not required when a portable ladder is used to reach a fixed ladder on structures such as utility towers and billboards where the bottom of the fixed ladder is elevated to limit access.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40030, filed 10/4/05, effective 1/1/06.]

#### **WAC 296-876-40035 Exposed electrical hazards.**

**You must:**

- Use ladders with nonconductive side rails where the ladder could contact uninsulated, energized electric lines or equipment.
  - Metal ladders or other ladders specifically designed to permit grounding or dissipation of static electricity may be used around high static electrical fields if all of the following are met:
    - Using nonconductive ladders would present a greater hazard than using conductive ladders.
    - Ladders are prominently marked and identified as being conductive.
    - Ladders are grounded when used near energized lines or equipment.

**Note:** Examples of ladders with conductive side rails are metal ladders, and wood or reinforced plastic ladders with metal side rail reinforcement.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40035, filed 10/4/05, effective 1/1/06.]

#### **WAC 296-876-40040 Persons on ladders.**

**You must:**

- Make sure a ladder is not moved, shifted, or adjusted while anyone is on it.
  - Secure the ladder at the top and bottom when working from it.
  - Use a safety belt with a lanyard that is secured to the ladder when doing any work that:
    - Requires the use of both hands;
- AND**
- Is done from a ladder more than twenty-five feet above the ground or floor.
  - Prohibit work being done from a ladder more than twenty-five feet above the ground or floor if the work requires wearing eye protection or a respirator.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40040, filed 10/4/05, effective 1/1/06.]

#### **WAC 296-876-40045 Multisection ladders.**

**You must:**

- Make sure not to tie or fasten ladder sections together to make longer ladders unless:
  - The ladder manufacturer endorses this type of use;

**AND**

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- You have hardware fittings specifically designed for this purpose.
  - Make sure each section of a multisection ladder, when fully extended and locked in position to be used, overlaps the adjacent section as indicated in Table 2, Minimum Required Overlap for Extension Ladders.

**Table 2**  
**Minimum Required Overlap for Extension Ladders**

<b>If the ladder size (feet) is:</b>	<b>Minimum required overlap for a two-section ladder is (feet):</b>
Up to and including 36	3
Over 36 up to and including 48	4
Over 48 up to and including 60	5

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40045, filed 10/4/05, effective 1/1/06.]

#### **WAC 296-876-40050 Self-supporting ladders.**

**You must:**

- Make sure self-supporting ladders are not used as single ladders or in the partially closed position.
- Make sure stepladders are fully opened with the spreaders locked.
- Make sure not to climb on the rear braces of a self-supporting ladder unless they are designed and recommended for that purpose by the manufacturer.
- Prohibit standing or stepping on the:
  - Top cap and top step of a step or trestle ladder.
  - Bucket or pail shelf of a self-supporting ladder.

**Exemption:** The restriction against using the top step is not applicable if it is eighteen inches or more below the top cap.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 05-20-068, § 296-876-40050, filed 10/4/05, effective 1/1/06.]

#### **WAC 296-876-500 Fixed ladder design and construction—Section contents.**

**Your responsibility:**

- To make sure fixed ladders installed on or after December 1, 2006, meet design and construction requirements.
  - Design and construction—Fixed ladders installed on or after December 1, 2006.
- WAC 296-876-50010

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-500, filed 7/24/06, effective 12/1/06; 05-20-068, § 296-876-500, filed 10/4/05, effective 1/1/06.]

#### **WAC 296-876-50010 Design and construction—Fixed ladders installed on or after December 1, 2006.**

**You must:**

- Make sure fixed ladders installed on or after December 1, 2006, meet the design and construction requirements of ANSI A14.3-2002, American National Standard for Ladders-Fixed-Safety Requirements.

**Note:** Ladders will be considered to have met the requirements of this section if they meet the design and construction requirements of ANSI A14.3, American National Standard for Ladders-Fixed-Safety Requirements, in effect at the time they are installed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-50010, filed 7/24/06, effective 12/1/06.]

### **WAC 296-876-600 Fixed ladder design and construction—Section contents.**

#### **Your responsibility:**

To make sure fixed ladders installed before December 1, 2006, meet design and construction requirements.

Design and construction—Fixed ladders installed before December 1, 2006.

WAC 296-876-60005

Design loads.

WAC 296-876-60010

Pitch.

WAC 296-876-60015

Welding.

WAC 296-876-60020

Ladder surfaces.

WAC 296-876-60025

Rungs, cleats and steps.

WAC 296-876-60030

Side rails.

WAC 296-876-60035

Clearances

WAC 296-876-60040

Step-across distance.

WAC 296-876-60045

Extensions and grab bars.

WAC 296-876-60050

Hatches.

WAC 296-876-60055

Platforms.

WAC 296-876-60060

Protective structures and equipment.

WAC 296-876-60065

Cages.

WAC 296-876-60070

Wells.

WAC 296-876-60075

Ladder safety devices.

WAC 296-876-60080

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-600, filed 7/24/06, effective 12/1/06; 05-20-068, § 296-876-600, filed 10/4/05, effective 1/1/06.]

### **WAC 296-876-60005 Design and construction—Fixed ladders installed before December 1, 2006.**

#### **You must:**

• Make sure fixed ladders installed **before** December 1, 2006, meet the requirements of WAC 296-876-60010 through 296-876-60080.

**Note:** Ladders will be considered to have met the requirements of this section if they meet the design and construction requirements of ANSI A14.3, American National Standard for Ladders-Fixed-Safety Requirements, in effect at the time they are installed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60005, filed 7/24/06, effective 12/1/06.]

### **WAC 296-876-60010 Design loads.**

#### **You must:**

[Title 296 WAC—p. 3114]

• Make sure each ladder is able to support, without failure, the total of the following loads:

– At least two loads of two hundred and fifty pounds each, concentrated between any two consecutive attachments.

– Any additional concentrated loads of two hundred and fifty pounds each determined from the anticipated use of the ladder.

– Anticipated loads caused by all of the following that apply:

■ Ice buildup.

■ Winds.

■ Rigging attached to the ladder, including the load to be lifted.

■ Impact loads resulting from the use of ladder safety devices.

• Make sure the design of rails, supports, and fastenings includes:

– Live loads to be supported by the ladder

**and**

– The weight of the ladder and everything attached to it.

• Consider all live loads to be concentrated at the point or points that will cause the maximum stress on the ladder or structural member.

• Make sure each step or rung is capable of supporting a single concentrated load of at least two hundred fifty pounds applied in the middle of the step or rung.

• Make sure the design stresses for wood components of ladders meet the requirements and specifications of ANSI A14.1, American National Standard for Ladders-Portable Wood-Safety Requirements, in effect when the ladder was installed.

• Make sure fastenings are designed to meet the ladder load requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60010, filed 7/24/06, effective 12/1/06.]

### **WAC 296-876-60015 Pitch.**

#### **You must:**

• Make sure the pitch of the ladder is no greater than ninety degrees from the horizontal.

**Note:** • The preferred pitch of fixed ladders is within the range of seventy-five to ninety degrees from the horizontal. Ladders with a pitch range of sixty to seventy-five degrees from the horizontal are considered substandard and are only permitted if necessary to meet the installation requirements.

• Fixed stairs are an alternative for installations where a pitch angle of less than sixty degrees is necessary. See Fixed industrial stairs, WAC 296-24-765, in the General Safety and Health Standards, chapter 296-24 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60015, filed 7/24/06, effective 12/1/06.]

### **WAC 296-876-60020 Welding.**

#### **You must:**

• Make sure welding meets the requirements of the ANSI A14.3, American National Standard for Ladders-Fixed-Safety Requirements, in effect at the time the ladder was installed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60020, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60025 Ladder surfaces.****You must:**

- Make sure all parts and surfaces of the ladder are free of splinters, sharp edges, burrs, or projections that may be hazardous to persons using the ladder.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60025, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60030 Rungs, cleats and steps.****You must:**

- Make sure rungs have a minimum diameter as follows:
  - Rungs of wood ladders are at least one and one-eighth inches.
  - Rungs of metal ladders subject to unusually corrosive exposures, such as individual metal rungs imbedded in concrete which serve as access to pits and to other areas under floors, are at least one inch.
  - Rungs of all other metal ladders are at least three-quarters inch.
- Make sure rungs, cleats, and steps are all of the following:
  - Parallel.
  - Level.
  - Uniformly spaced throughout the length of the ladder.
  - Spaced so the distance from the centerline of one rung to the centerline of the next rung does not exceed twelve inches.

**Exception:** The vertical distance from the ground, floor, or roof at the access level to the first rung may be adjusted within a range of fourteen inches.

**You must:**

- Make sure the minimum inside clear width of the stepping surface of rungs, steps, or cleats is sixteen inches.
- Make sure individual rung or step-type ladders have rungs or steps that are shaped so that a person's foot cannot slide off the end.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60030, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60035 Side rails.****You must:**

- Make sure the shape of the side rail:
  - Provides an adequate gripping surface
- and**
- Is uniform throughout the length of climb.
- Make sure a side rail that has been spliced to obtain a longer length is at least equivalent in strength to a one-piece side rail made of the same material.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60035, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60040 Clearances.****You must:**

- Make sure ladders without wells or cages are at least thirty inches from the nearest permanent object on the climbing side, measured perpendicular to the ladder from the centerline of the rungs, cleats, or steps.

**Exemption:** When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of the rungs, cleats, or steps and an obstruction on the climbing side may be reduced to twenty-four

inches if a deflection device is installed to guide persons around the obstruction.

**You must:**

- Make sure ladders without wells or cages have a clear width from the nearest permanent object on each side of the ladder of at least fifteen inches, measured from the center of the rungs, cleats, or steps.
- Make sure the distance from the centerline of the rungs, cleats, or steps to the nearest permanent object in back of the ladder is at least seven inches.

**Exemption:** Fixed ladders in elevator pits may reduce the minimum clearance from the ladder to the nearest permanent object in back of the ladder to four and one-half inches.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60040, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60045 Step-across distance.****You must:**

- Make sure a through ladder at the point of access or egress has a step-across distance, measured from the centerline of the steps or rungs to the nearest edge of the landing area, that is:
  - Not less than seven inches
- or**
- Greater than twelve inches.
- Make sure a side-step ladder at the point of access or egress has a step-across distance, measured from the side rail of the ladder to the nearest edge of the landing area, that is:
  - Not less than seven inches
- or**
- Greater than twelve inches.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60045, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60050 Extensions and grab bars.****You must:**

- Make sure the side rails of through or side-step ladders extend forty-two inches above the top of the access level or landing platform.

**Note:** For a parapet ladder, the access level is:
 

- The roof if the parapet is cut to permit passage through it

**or**

- The top of the parapet if it is continuous and uncut.

**You must:**

- Make sure the extension of a through ladder above the access level or landing platform has:
  - Steps or rungs omitted from the extension
- and**
- Clearance between the side rails that is:
  - Not less than twenty-four inches
- or**
- Greater than thirty inches.

**Exemption:** The maximum clearance between side rails of the extension may be increased to thirty-six inches if the ladder has a ladder safety device.

**You must:**

- Make sure the side rails of through or side-step ladders extend forty-two inches above the top of the access level or landing platform.
- Make sure side-step ladders have the steps or rungs and the side rails continuous in the extension.

- Make sure individual rung-step ladders are extended at least forty-two inches above the access level or landing platform by:

- Continuing the rung spacings as horizontal grab bars

**or**

- Providing vertical grab bars that have the same lateral spacing as the vertical legs of the rungs.

**Exemption:** Extensions are not required for individual rung-step ladders with access openings through a manhole or hatch.

**You must:**

- Make sure grab bars:
  - Are at least four inches from the nearest permanent object in back of the grab bar, measured from the centerline of the grab bar

**and**

- Do not extend beyond the rungs on the climbing side of the ladder.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60050, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60055 Hatches.**

**You must:**

- Make sure counterbalanced hatch covers open at least seventy degrees from the horizontal.

- Make sure the inside clear width of the hatch is a nominal thirty inches.

- Make sure the distance from the centerline of the rungs or cleats to the edge of the hatch opening on the climbing side, measured perpendicular to the ladder, is:

- Not less than twenty-four inches

**or**

- Greater than thirty inches.

- Make sure hatches with clearance on the climbing side of the ladder that is between twenty-four and twenty-seven inches are fitted with a deflector plate mounted at an angle of sixty degrees from the horizontal.

**Note:** The springs or other counterbalance mechanisms for the hatch may project into the hatch opening provided they do not reduce clearance to less than twenty-four inches and a deflector plate is installed to guide persons around the obstruction.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60055, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60060 Platforms.**

**You must:**

- Make sure landing platforms for side-step ladders extend at least thirty inches on the climbing side of the ladder.

- Make sure landing platforms are:

- At least thirty inches wide

**and**

- Equipped with standard railings and toeboards placed to allow safe access to the ladder.

**Reference:** Requirements for standard railings and toeboards are in Railing, toeboards, and cover specifications, WAC 296-24-75011, the General Safety and Health Standards, chapter 296-24 WAC.

**You must:**

- Make sure the top rung or step of the ladder is level with the landing served by the ladder.

[Title 296 WAC—p. 3116]

- Make sure the spacing from the landing platform to the first rung below the platform of a through ladder is the same as the rung spacing of the ladder.

- Make sure, if two or more separate ladders are used to reach an elevated work area, that the ladders are offset with a platform or landing between them.

**Exemption:** A platform or landing is not required when a portable ladder is used to reach a fixed ladder on structures such as utility towers and billboards where the bottom of the fixed ladder is elevated to limit access.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60060, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60065 Protective structures and equipment.**

**You must:**

- Make sure a cage, well, or ladder safety system is provided if:

- The length of climb is less than twenty-four feet

**and**

- The top of the ladder is more than twenty-four feet above the ground, floor, or roof.

- Make sure a ladder with a single length of climb that is equal to or greater than twenty-four feet is either:

- Equipped with a ladder safety device

**or**

- Uses multiple ladder sections and meets all of the following:

- Each section is provided with a cage or well.

- The length of climb of any ladder section is not greater than fifty feet.

- Each ladder section is offset from adjacent sections.

- Landing platforms are provided at maximum intervals of fifty feet.

**Exemption:** During construction activities, a self-retracting lifeline with landing platforms provided at maximum intervals of one hundred and fifty feet may be used instead of a ladder safety device or multiple ladder sections.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60065, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-60070 Cages.**

**You must:**

- Make sure the cage meets all of the following:

- Extends at least forty-two inches above the top of the platform or above the point of access and egress at the top of the ladder.

- Has provisions for accessing and egressing the platform or the point of access or egress of the ladder.

- There is at least twenty-seven inches, but not more than thirty inches, from the cage to the centerline of the step or rung at all points except where the cage flares at the bottom of the ladder.

- The cage is at least twenty-seven inches wide.

- There are no projections inside the cage.

- Make sure the bottom of the cage is:

- At least seven feet but not more than eight feet above the point of access to the bottom of the ladder

**and**

– Flared at least four inches all around within the distance between the bottom horizontal band and the next higher band.

- Make sure vertical bars are:

- Spaced at intervals of nine and one-half inches or less on center around the circumference of the cage

**and**

- Fastened to the inside of the horizontal bands.

- Make sure the horizontal bands meet all of the following:

- The vertical intervals between horizontal bands is not more than four feet on center.

- The horizontal bands of ladders with side rails are fastened to the side rails.

- The horizontal bands of individual-rung ladders are fastened directly to the structure, building, or equipment.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60070, filed 7/24/06, effective 12/1/06.]

#### **WAC 296-876-60075 Wells.**

**You must:**

- Make sure there is at least twenty-seven inches, but not more than thirty inches, from the centerline of the step or rung to the inside face of the well on the climbing side of the ladder.

- Make sure the inside clear width is at least thirty inches.

- Make sure the well:

- Completely encircles the ladder

**and**

- Is free of projections.

- Make sure the bottom of the wall on the access side is at least seven feet, but not more than eight feet, above the point of access to the bottom of the ladder.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60075, filed 7/24/06, effective 12/1/06.]

#### **WAC 296-876-60080 Ladder safety devices.**

**You must:**

- Make sure ladder safety devices and related support systems meet all of the following:

- Are capable of withstanding, without failure, the test drop of a five hundred pound weight for a free-fall distance of eighteen inches.

- The device does not require a person to continually hold, push, or pull any part of the device and allows them to have both hands free to grip the ladder.

- In the event of a fall, the device:

- Is activated within two feet

**and**

- Limits the fall velocity to seven feet per second or less.

- Uses a connection between the carrier or lifeline and the point of attachment on the full body harness that is not longer than nine inches.

- Make sure ladder safety devices with rigid carriers have mountings that:

- Are attached at each end of the carrier

**and**

- Have intermediate mountings that are all of the following:

- Spaced along the entire length of the carrier in accordance with the manufacturer's recommendations.

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- Installed within one foot below each splice on the carrier.

- Have a maximum distance between mountings that is twenty-five feet or less.

- Make sure ladder safety devices with flexible carriers have:

- Mountings that are attached at each end of the carrier

**and**

- Cable guides that are spaced at least twenty-five feet, but no further than forty feet, apart along the entire length of the carrier.

- Make sure the design and installation of mountings and cable guides does not reduce the design strength of the ladder.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-60080, filed 7/24/06, effective 12/1/06.]

#### **WAC 296-876-700 Fixed ladders inspection and maintenance—Section contents.**

**Your responsibility:**

To make sure fixed ladders are inspected and maintained properly.

Protection against corrosion and deterioration.

WAC 296-876-70005

Inspection and repair.

WAC 296-876-70010

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-700, filed 7/24/06, effective 12/1/06.]

#### **WAC 296-876-70005 Protection against corrosion and deterioration.**

**You must:**

- Paint or otherwise treat metal ladders or metal parts to resist rust and corrosion if they are:

- Exposed to the elements

**or**

- Located where rust or corrosion could be expected.

- Treat wood ladders used in conditions where decay may occur with a nonirritating preservative.

- Make sure wood ladders are not coated with an opaque covering except for the minimum amount necessary for identification and warning information which may be placed on one face only of a side rail.

- Treat the interface between different materials or use other means to prevent:

- One material from damaging or having a harmful effect on another material

**and**

- Electrolytic action between dissimilar metals.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-70005, filed 7/24/06, effective 12/1/06.]

#### **WAC 296-876-70010 Inspection and repair.**

**You must:**

- Keep ladders in safe condition.

- Have a competent person inspect a ladder for visual defects:

- Periodically

**and**

- After any occurrence that could affect safe use.

- Make sure any ladder with structural damage or other hazardous defect is immediately removed from service.

- Note:**
- Structural damage includes, but is not limited to, any of the following:
    - Broken or missing rungs, cleats, or steps.
    - Broken or split rails.
    - Corroded components.
    - Bolts and welds missing or not secure.
  - A ladder is considered to be removed from service if any of the following are done:
    - It is marked to identify it as defective.
    - It is tagged with "do not use" or similar language.
    - It is blocked so that it cannot be used, for example, by using a plywood attachment that spans several rungs.

**You must:**

- Make sure repairs restore the ladder to a condition meeting its original design criteria.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-70010, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-800 Fixed ladder use—Section contents.**

**Your responsibility:**

- To use fixed ladders safely.
- Designed load.
- WAC 296-876-80005
- Climbing and descending.
- WAC 296-876-80010

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-800, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-80005 Designed load.**

**You must:**

- Make sure not to overload ladders. Do not exceed either the:
  - Maximum intended load
- or**
- Manufacturer's rated capacity.

**Definition:**

The **maximum intended load** is the total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a ladder or ladder component at any one time.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-80005, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-80010 Climbing and descending.**

**You must:**

- Have both hands free to hold on to the ladder.
- Face the ladder when climbing or descending.
- Keep ladders free of oil, grease, or other slippery materials.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-80010, filed 7/24/06, effective 12/1/06.]

**WAC 296-876-900 Definitions.**

**Cage.** An enclosure that encircles the climbing space of a fixed ladder. It is fastened to the ladder side rails or to the structure and may also be called a cage or basket guard.

**Cleat.** A ladder crosspiece used in climbing or descending. Also called a step or rung.

**Equivalent.** Alternative design, material or method to protect against a hazard. You have to demonstrate it provides

an equal or greater degree of safety for employees than the method, material or design specified in the rule.

**Extension ladder.** A nonself-supporting portable ladder consisting of two or more sections. The sections travel in guides or brackets that allow the length of the ladder to be changed. The size is designated by the sum of the lengths of each section, measured along the side rails.

**Failure.** The ladder or ladder component loses the ability to carry the load, breaks, or separates into component parts.

**Fastenings.** A fastening is a device to attach a ladder to a structure, building, or equipment.

**Fixed ladder.** A ladder permanently attached to a structure, building, or equipment.

**Grab bars.** Handholds placed adjacent to or as an extension above ladders for the purpose of providing access beyond the limits of the ladder.

**Job-made ladder.** A ladder that is made, not commercially manufactured, to fit a specific job situation. They are for temporary use until a particular phase of construction is completed or until permanent stairways or fixed ladders are ready to use.

**Individual-rung/step ladder.** A fixed ladder consisting of individual steps or rungs mounted directly to the side or wall of the structure, building, or equipment.

**Ladder.** A device having steps, rungs, or cleats that can be used to climb or descend.

**Ladder safety device.** Any device, other than a cage or well, designed to arrest the fall of a person using a fixed ladder.

**Ladder type.** The designation that identifies the maximum intended load (working load) of the ladder. Ladder types are as follows:

Duty Rating	Ladder Type	Use	Maximum Intended Load (Pounds)
Extra Heavy-Duty	IA	Industry, utilities, contractors	300
Heavy-Duty	I	Industry, utilities, contractors	250
Medium-Duty	II	Painters, offices, light maintenance	225
Light-Duty	III	General household use	200

**Landing.** Any area such as the ground, roof, or platform that provides access or egress to a ladder.

**Maximum intended load.** The total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a ladder or ladder component at any one time. Sometimes referred to as working load.

**Pitch.** The included angle between the horizontal and the ladder, measured on the opposite side of the ladder from the climbing side.

**Portable ladder.** A ladder that can be readily moved or carried.

**Reinforced plastic.** A plastic that has high-strength fillers embedded in the base resin to increase strength.

**Reinforced plastic ladder.** A ladder whose side rails are reinforced plastic. The crosspieces, hardware, and fasteners may be made of metal or other suitable material.

**Rung.** A ladder crosspiece used in climbing or descending. Also called a cleat or step.

**Side-step ladder.** A fixed ladder that requires a person to step to the side of the ladder side rails to reach the landing.

**Single ladder.** A nonself-supporting portable ladder, nonadjustable in length, consisting of one section. The size is designated by the overall length of the side rail.

**Single-rail ladder.** A portable ladder with crosspieces mounted on a single rail. Single-rail ladders are prohibited from use.

**Special-purpose ladder.** A portable ladder that is made by modifying or combining design or construction features of the general-purpose types of ladders in order to adapt the ladder to special or specific uses.

**Step.** A ladder crosspiece used in climbing or descending. Also called a cleat or rung.

**Stepladder.** A self-supporting portable ladder, nonadjustable in length, with flat steps and hinged at the top. The size is designated by the overall length of the ladder measured along the front edge of the side rails.

**Through ladder.** A fixed ladder that requires a person to step between the side rails of the ladder to reach the landing.

**Trestle ladder.** A self-supporting portable ladder, nonadjustable in length, consisting of two sections hinged at the top to form equal angles with the base. The size is designated by the length of the side rails measured along the front edge.

**Well.** A walled enclosure around a fixed ladder that provides a person climbing the ladder with the same protection as a cage.

**Working length.** The length of a nonself-supporting ladder, measured along the rails, from the base support point of the ladder to the point of bearing at the top.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-16-020, § 296-876-900, filed 7/24/06, effective 12/1/06.]

**Chapter 296-878 WAC**

**SAFETY STANDARDS FOR WINDOW CLEANING**

**WAC**

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296-878-18015	Use window-cleaners' belts safely.
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296-878-19005	Select appropriate boatswains' chairs.
296-878-19010	Safely use boatswains' chairs rigged with a block and tackle.
296-878-200	Rope descent systems.
296-878-20005	Select appropriate rope descent systems.
296-878-20010	Safely use rope descent systems.
296-878-20015	Safely use rope descent devices.
296-878-210	Equipment prohibited.
296-878-21005	Prohibit equipment from use.
296-878-220	Definitions.

**WAC 296-878-100 Scope.** These rules apply to all window-cleaning activities performed on the inside or outside of a building in which the window cleaner is working from a level that is located more than forty-eight inches above grade.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-100, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-10005 Summary.**

**Your responsibility:**

Make sure workers clean windows safely, and properly use and maintain their window-cleaning equipment.

**IMPORTANT:**

Window-cleaning equipment includes window-cleaner's belts, boatswains' chairs, rope descent systems, ladders, supported scaffolds and the support equipment used to suspend employees cleaning windows.

**You must:**

**Training**

Train workers to use window-cleaning equipment

WAC 296-878-11005

**Building surfaces and fixtures**

Make sure building surfaces and fixtures are safe to use

WAC 296-878-12005

**Inspection procedures**

Inspect the area to be cleaned

WAC 296-878-13005

Inspect window-cleaning equipment before use

WAC 296-878-13010

**Develop site-specific service and emergency plans**

Develop a site-specific service and emergency recovery plan for window-cleaning operations

WAC 296-878-14005

**Equipment**

Select and use appropriate equipment

WAC 296-878-15005

Other window-cleaning equipment

WAC 296-878-15010

Select appropriate rope for suspended equipment

WAC 296-878-15015

Select appropriate carabiners

WAC 296-878-15020

Use fall protection equipment

WAC 296-878-15025

**Warning signs and barricades**

Provide warning signs and barricades when suspended equipment is used

WAC 296-878-16005

**Power line clearances**

Maintain clearance between window cleaners and power lines

WAC 296-878-17005

**Window-cleaners' belts and anchors**

Select appropriate window-cleaners' belts and anchors

WAC 296-878-18005

Inspect the anchors you plan to use for window cleaning

WAC 296-878-18010

Use window-cleaners' belts safely

WAC 296-878-18015

Move safely on the outside of buildings

WAC 296-878-18020

**Boatswains' chairs**

Select appropriate boatswains' chairs

WAC 296-878-19005

Safely use boatswains' chairs rigged with a block and tackle

WAC 296-878-19010

**Rope descent systems**

Select appropriate rope descent systems

WAC 296-878-20005

Safely use rope descent systems

WAC 296-878-20010

Safely use rope descent devices

WAC 296-878-20015

**Equipment prohibited**

Prohibit equipment from use

WAC 296-878-21005

**Definitions**

WAC 296-878-220.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-10005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-110 Training.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-110, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-11005 Train workers to use window-cleaning equipment.****You must:**

- Provide the following training to workers before they use window-cleaning equipment on the job:
  - Proper care and maintenance of the equipment
  - Review manufacturer's instructions for proper equipment use
  - Methods for inspection, assembly, and dismantling of components
    - Identify anchorages
    - A complete understanding of safe working conditions
    - How employees will be rescued.
- Provide additional training to workers using window-cleaners' belts in all the following areas:
  - How to select the proper-sized belt
  - How to use anchors and terminals
  - How to deal with obstructions and slippery/wet surfaces.

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- Provide additional training to workers using boatswains' chairs and rope descent systems in all the following areas:

- Proper rigging practices
  - Fall arrest requirements
  - Proper methods of descending
  - The effects of wind on window-cleaning operations when a worker is suspended
  - Proper methods of hoisting for ascents.
- Document the training by recording all of the following:
    - The name and signature of the trainer/educator
    - The name and signature of the student
    - The subjects in which the workers were trained
    - The date of the training
    - The location of the training.

**Note:** • You do not need a specialized educator to provide training. You may use a qualified person to conduct the training. A qualified person is defined as a person who has:

- Extensive knowledge, training, and experience about the subject matter, work, or project
- A recognized degree, certificate, or professional standing
- Successful demonstration of problem solving skills in connection with the subject, work, or project.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-11005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-120 Building surfaces and fixtures.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-120, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-12005 Make sure building surfaces and fixtures are safe to use.****You must:**

- Make sure building surfaces and fixtures are safe to be used before you begin the window-cleaning operation. This includes:
  - Guardrails, parapets, cornices and other building surfaces used to support suspended loads
  - Permanently installed fixtures used as anchorages and tiebacks
  - Window-cleaning equipment support systems permanently dedicated to the building.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-12005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-130 Inspection procedures.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-130, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-13005 Inspect the area to be cleaned.****You must:**

- Inspect the building before cleaning to make sure there are no areas that can damage worker fall protection equipment and window-cleaning equipment. Inspect:
  - Sharp edges of parapets
  - Window frames
  - Open projected windows
  - Cornices
  - Overhangs
  - Any other areas that may abrade, sever, weaken, or damage the equipment.

(2007 Ed.)

- Make sure all working surfaces are safe and free from hazards such as:
  - Grease
  - Oil
  - Other slippery substances.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-13005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-13010 Inspect window-cleaning equipment before use.**

**You must:**

- (1) Store your window-cleaning equipment in a way that:
  - Is easy to get to, inspect, and safely take out for use
  - Provides protection from moisture, sunlight, or corrosion.
- (2) Make sure a competent person inspects these items before each use:
  - Window-cleaners' belts
  - Boatswains' chairs
  - All components of rope descent systems
  - Suspension devices
  - Certified roof anchorages
  - Primary support ropes or lines
  - The descent device
  - Carabiners or shackles
  - A seatboard or boatswain's chair
  - Wear points on rope descent system components exposed to constant friction.
- (3) Make sure you do not use any piece of window-cleaning equipment with defects.
  - Prohibit makeshift repairs to any piece of window-cleaning equipment
  - Label any piece of window-cleaning equipment that is defective "dangerous, do not use."
- (4) Secure any padding or softeners so they do not come loose from:
  - The surface of the building
  - The rope if not attached to the building.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-13010, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-140 Develop site-specific service and emergency plans.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-140, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-14005 Develop a site-specific service and emergency recovery plan for window-cleaning operations.**

**You must:**

- Make sure that a qualified person develops a written plan for each location to be cleaned that identifies:
  - Hazardous areas
  - Drop zones
  - Safety features
  - Methods for emergency recovery of workers working from suspended equipment, or other types of installations, in the event of equipment failure or any other kind of disability.
- Keep the plan at the work site during the entire cleaning operation.

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- Note:** You may use an outside service for rescue and recovery (such as a fire department) if:
- The rescue personnel will be able to reach the victims without undue delay
  - They have the necessary equipment to retrieve the victims
  - They are trained and proficient in high angle rescue techniques.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-14005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-150 Equipment.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-150, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-15005 Select and use appropriate equipment.**

**You must:**

- (1) Make sure that all equipment provided to workers for window-cleaning operations is engineered, designed, and intended for use in commercial applications.

**Note:** Equipment that is designed or labeled for recreational use or rescue use only is prohibited for use in window-cleaning operations.

**You must:**

- (2) Make sure that the window-cleaning equipment is not altered unless it is specifically approved in writing by the original manufacturer or a registered professional engineer.
- (3) Provide manufacturer's instructions to employees for all window-cleaning equipment they will use.

**Reference:** Use Table 1 for other window-cleaning equipment requirements.

**Table 1  
Other window-cleaning equipment**

	<b>If you use:</b>	<b>Then follow all requirements in:</b>
1.	Portable ladders	WAC 296-800-290, Portable ladders
2.	Supported scaffolds	Chapter 296-24 WAC, PART J-2, Scaffolds
3.	Suspension ropes and lifelines Powered and manual hoists Suspended scaffold equipment	Chapter 296-24 WAC, PART J-2, Scaffolds
4.	Single and multipoint adjustable suspension scaffolds	Chapter 296-24 WAC, PART J-2, Scaffolds
5.	Powered platforms	Chapter 296-24 WAC, PART J-3, Powered platforms

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-15005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-15015 Select appropriate rope for suspended equipment.**

**You must:**

- Make sure all rope used for suspended equipment has a minimum breaking strength of five thousand pounds.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-15015, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-15020 Select appropriate carabiners.**

**You must:**

- Use carabiners for connecting hardware or attaching boatswains' chairs, descent devices, and lifelines to anchors.
- Use carabiners with a minimum tensile load of five thousand pounds.

- Make sure carabiners are either manual or auto-locking.

**Note:** You may secure a rope to an anchor with a knot if normal daily use of the rope will not decrease its initial breaking strength below five thousand pounds.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-15020, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-15025 Use fall protection equipment.**

#### **You must:**

(1) Make sure the fall arrest system meets the requirements of WAC 296-24-88050 mandatory Appendix C, Part I, Personal fall arrest systems.

- Use and inspect fall arrest equipment in accordance with the requirements of WAC 296-24-88050, mandatory Appendix C, Part I, Personal fall arrest systems.

- Make sure all workers suspended from a boatswain's chair or rope descent system use an independent fall arrest system where the fall arrest anchorage is separate from the suspension system anchorage.

- Make sure workers operating powered platforms wear and use a fall arrest system.

- Make sure workers assemble and wear their personal fall arrest equipment before they approach the point of suspension.

- Make sure workers are connected at all times to the fall arrest system while they are suspended.

(2) Make sure the boatswain's chair or rope descent system is connected at all times to the suspension line.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-15025, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-160 Warning signs and barricades.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-160, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-16005 Provide warning signs and barricades when suspended equipment is used.**

#### **You must:**

(1) Place warning signs below suspended equipment

(2) Block the ground area with barricades directly under or next to the work zone

(3) Assign a competent person to decide if additional protection is necessary

(4) Make sure all tools used by the worker are attached to the worker, seatboard, or boatswain's chair.

**Reference:** Rules for protecting workers from overhead hazards are listed in WAC 296-800-16055, Make sure your employees use appropriate head protection.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-16005, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-170 Power line clearances.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-170, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-17005 Maintain clearance between window cleaners and power lines.**

#### **You must:**

- Maintain clearances between window cleaners and power lines as indicated in Tables 2 and 3.

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**Table 2**

### **Minimum Clearances from Power Lines - Insulated Lines**

Voltage	Minimum distance	Alternatives
Less than 300 volts	3 feet (0.9 m)	
300 volts to 50 kv	10 feet (3.1 m)	
More than 50 kv	10 feet (3.1 m) plus 0.4 inches (1.0 cm) for each 1 kv over 50 kv	2 times the length of the line insulator, but never less than 10 feet (3.1 m)

**Table 3**

### **Minimum Clearances from Power Lines - Uninsulated Lines**

Voltage	Minimum distance	Alternatives
Less than 50 kv	10 feet (3.1 m)	
More than 50 kv	10 feet (3.1 m) plus 0.4 inches (1.0 cm) for each 1 kv over 50 kv	2 times the length of the line insulator, but never less than 10 feet (3.1 m)

#### **You must:**

- Follow these procedures when window cleaners need to get closer to power lines than allowed in Tables 2 and 3:

- Notify the utility company or electrical system operator of the need to work closer than the minimum clearances to power lines before starting the work

- Begin the work only when the utility company or electrical system operator has deenergized or relocated the lines, or installed protective coverings to prevent accidental contact with the lines.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-17005, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-180 Window-cleaners' belts and anchors.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-180, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-18005 Select appropriate window-cleaners' belts and anchors.**

#### **You must:**

- Make sure window-cleaners' belts and anchors conform to the:

- Design, manufacture, and maintenance requirements of ANSI/IWCA 1-14.1-2001

#### **AND**

- Manufacturer's specifications.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-18005, filed 10/28/02, effective 1/1/03.]

### **WAC 296-878-18010 Inspect the anchors you plan to use for window cleaning.**

#### **You must:**

- Make sure you do not use anchors if they:

- Appear to be damaged

- Appear deteriorated

- Appear to be worn

- Appear to be loose

- Appear to be unsecured to the building or window frame

- Will not allow the belt terminal to easily slip over the anchor head.

- Use window-cleaner's belts only if:
  - The area to be cleaned is safe
  - All anchors intended for use are safe.
- Make sure window ledges and frames will not impair the safe use of the window-cleaner's belt.

**Note:** If unsafe anchors are found, report them to the building owner or manager and do not use them.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-18010, filed 10/28/02, effective 1/1/03.]

#### **WAC 296-878-18015 Use window-cleaners' belts safely.**

##### **You must:**

- Make sure workers do not extend more than one arm beyond the window sash when cleaning windows from inside a building.
  - Attach one belt terminal to an anchor before you put more than one arm outside the window.
  - Pull on the terminal strap and look for signs of damage to the anchor.
  - Attach both belt terminals to anchors before climbing out the window.
  - Keep all belt terminals attached during the entire cleaning operation.
  - Make sure the worker keeps one terminal attached to an anchor when reentering the window and until the worker is inside.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-18015, filed 10/28/02, effective 1/1/03.]

#### **WAC 296-878-18020 Move safely on the outside of buildings. You must:**

- Make sure you travel on the outside of the building only when
  - You keep at least one window-cleaner's belt terminal attached at all times
  - The anchors are not more than forty-eight inches apart.

**Note:** Anchors can be up to seventy-two inches apart if

- The sill or ledge is continuous
- The sill or ledge is at least twelve inches wide
- The sill or ledge has a slope less than five degrees
- There is at least six inches of window sill in front of the mullions.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-18020, filed 10/28/02, effective 1/1/03.]

#### **WAC 296-878-190 Boatswains' chairs.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-190, filed 10/28/02, effective 1/1/03.]

#### **WAC 296-878-19005 Select appropriate boatswains' chairs.**

##### **You must:**

- (1) Make sure that when you use a block and tackle, it is the correct size, including:
  - Correctly-sized ball bearings or bushed blocks
  - Safety hooks
  - Eye-spliced rope
  - A minimum breaking strength of five thousand pounds.
- (2) Make sure all rope used with a boatswain's chair has a minimum breaking strength of five thousand pounds, including rope used for:

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- Suspension
  - Block and tackle
  - Seat slings.
- (3) Make sure the ropes on boatswain's chair seat slings:
    - Are reeved through the four corner holes in the seat
    - Cross each other on the underside of the seat
    - Are rigged so the chair cannot slip out of a level position.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-19005, filed 10/28/02, effective 1/1/03.]

#### **WAC 296-878-19010 Safely use boatswains' chairs rigged with a block and tackle.**

##### **You must:**

- (1) Make sure the rated capacity or the maximum intended load, whichever is less, is not exceeded.
- (2) Make sure the suspension rope stays vertical between the boatswain's chair and suspension device unless all of these requirements are met:
  - The rigging has been designed by a qualified person
  - The scaffold can be easily reached by rescuers
  - The suspension rope is protected from damage when a change in direction occurs
  - The scaffold will not swing and contact another surface.

- (3) Make sure a suspension height of seventy-five feet above grade or building setback is not exceeded.

**Exemption:** Suspension height may be up to one hundred thirty feet above grade or building setback if the boatswain's chair block and tackle has all of the following:

- An automatic braking system
- A design that minimizes the amount of force required to raise or lower the suspended worker
- An automatic braking system that automatically maintains an elevation when no force is applied to the tackle
- A system that does not slip.

##### **You must:**

- (4) Prohibit tying any kind of knot in a block and tackle system to maintain elevation.
- (5) Make sure another worker is stationed below any boatswain's chair rigged with a block and tackle who can assist the suspended employee.
- (6) Make sure workers do not attempt to increase the work area by swinging, swaying, or other maneuvers.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-19010, filed 10/28/02, effective 1/1/03.]

#### **WAC 296-878-200 Rope descent systems.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-200, filed 10/28/02, effective 1/1/03.]

#### **WAC 296-878-20005 Select appropriate rope descent systems.**

##### **You must:**

- Make sure the rope descent system is designed, used, and maintained according to:
  - ANSI/IWCA 1-14.1-2001
  - The manufacturer's instructions.
- Make sure the rope descent system has been manufactured and is intended to be used for window cleaning.

[Title 296 WAC—p. 3123]

**Note:** Equipment that is designed or labeled for recreational use or rescue use only is prohibited for use in window-cleaning operations.

**You must:**

- Make sure the rope descent system components are compatible and have a minimum tensile strength of five thousand pounds.

- This does not apply to the seatboard.

- Make sure the rope descent system has specific use instructions for each component.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-20005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-20010 Safely use rope descent systems.**

**You must:**

(1) Make sure workers use extreme care when using rope descent equipment around electrical service, heat sources, and turbulent areas, such as air vents.

(2) Connect the seatboard or boatswain's chair to the descent device with a manual or auto locking carabiner.

(3) Make sure workers are positioned in the seatboard or boatswain's chair before being suspended.

(4) Make sure workers do not reach more than six feet in any direction as measured from a centerline straight down from where the suspension rope bears on the building.

(5) Make sure workers do not descend rapidly, swing excessively, or stop suddenly.

(6) Make sure that, in addition to the suspended worker, there is one other person at the jobsite who is skilled in using the rope descent system and rescue procedures.

(7) Make sure you do not exceed a three hundred-foot height of descent as measured from grade or building setback.

(8) Make sure your site-specific service plan addresses the following hazards for descents over one hundred thirty feet as measured from grade or building setback:

- Sudden weather changes, such as wind gusts, micro bursts, or tunneling wind currents
- Inability of the rope descent system to function without using excessive force
- Workers suspended for long periods of time
- Rerigging and movement of main suspension and safety lines.

(9) Stabilize workers suspended from a rope descent system whenever the descent is higher than one hundred thirty feet, as measured from grade or building setback.

(10) Prohibit workers from working when wind speed makes any stabilization equipment ineffective.

**Note:** Provisions for stabilizing workers may include:

- Continuous stabilization, such as mullion tracks
- Intermittent stabilization, such as detent pins/buttons
- Work station stabilization, such as suction cups.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-20010, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-20015 Safely use rope descent devices.**

(1) Make sure the rated capacity or the maximum intended load, whichever is less, is not exceeded.

(2) Make sure the descent device manufacturer's specifications for rope diameter and construction are followed.

[Title 296 WAC—p. 3124]

(3) Make sure the rope is rigged through the descent device for a controlled rate of descent.

(4) Make sure the attachment point on the descent device is one piece with no gates or openings.

(5) Make sure the descent device will remain stationary when positive action is taken.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-20015, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-210 Equipment prohibited.**

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-210, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-21005 Prohibit equipment from use.**

**You must:**

- Prohibit use of the following equipment for window-cleaning operations:

- Portable sills

- Window jacks

- Capstan devices to suspend workers

- Suspension or fall-arrest ropes that are made entirely of polypropylene.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.-060. 02-22-027, § 296-878-21005, filed 10/28/02, effective 1/1/03.]

**WAC 296-878-220 Definitions.**

**Anchor, window-cleaner's belt** - Fall-preventing attachment points for direct attachment of the terminal portion of a window-cleaner's belt.

**Belt terminal** - That part of the safety belt that is attached to the anchor during the window-cleaning operation.

**Block and tackle** - A lifting device consisting of one or more pulley blocks reeved with chains, wire ropes, or fibre ropes used solely for raising and lowering a load or moving a load horizontally.

**Boatswain's chair** - A single-point adjustable suspension scaffold consisting of a seat or sling designed to support one worker in a sitting position.

**Capstan device** - An upright, spool-shaped cylinder used for hoisting or lifting weights that is turned by a motor or by hand.

**Carabiner** - An oblong metal ring with an openable spring-hinged side, used to clip a rope to an anchoring device.

**Competent person** - One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

**Drop (drop zone)** - A vertical area or work zone accessed by the worker or piece of equipment during one descent.

**Drop line** - A vertical line from a fixed anchorage, independent of the work surface.

**Fixture** - Attachments, anchors, anchorages, tie backs or support equipment permanently dedicated to a given site.

**Grade** - Means the ground, floor, sidewalk, roof, or any level surface that is considered a safe place to work.

**Lanyard** - A flexible line to secure a wearer of a safety belt or harness to a drop line, lifeline or fixed anchorage.

**Mullion** - A slender, vertical dividing bar between windows, panels, etc.

**Primary support/suspension** - A working line or approved anchorage used for attachment of a working line.

**Qualified person** - A person is qualified if they have one of the following:

- Extensive knowledge, training, and experience about the subject matter, work, or project
- A recognized degree, certificate, or professional standing
- Successful demonstration of problem solving skills in connection with the subject, work, or project.

**Rated capacity** - The combined weight of workers, tools, equipment, and other materials that the device is designed and installed to lift and support.

**Rope descent system (RDS)** - An assembly of components that allows the operator to control the rate of descent at any time. A rope descent system includes the following components:

- Suspension devices
- Certified roof anchorages
- Primary support ropes or lines
- The descent device
- Carabiners or shackles
- A seatboard or boatswain's chair.

**Terminal strap** - The strap or rope attached to the waist band on one end, and to the belt terminals on the other end.

**Window cleaning** - Cleaning, wiping, restoring or other methods of cleaning windows.

**Working line** - A rope suspended from an anchorage and used to access parts of a building.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. 02-22-027, § 296-878-220, filed 10/28/02, effective 1/1/03.]

**Chapter 296-900 WAC  
ADMINISTRATIVE RULES**

**WAC**

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296-900-16020	Post WISHA's violation correction hearing notice.
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**WAC 296-900-100 Scope.** This chapter applies to the following requirements and information regarding administration of the Washington Industrial Safety and Health Act (WISHA), chapter 49.17 RCW:

- Employer requests for using an alternative to WISHA requirements.
- Workplace inspections conducted by WISHA.
- Citations and penalties for violations of WISHA safety and health requirements.
- How to respond to actions that WISHA may take when requirements have been violated.
- Employer correction of cited violations, and notification to WISHA when the corrections are made.
- Employer obligations to inform employees.
- Reporting alleged safety and health hazards.
- Appeal and hearing processes for employers and employees.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-100, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-110 Variances.**

**Summary:**

**Employer responsibility:**

To follow requirements on granted variances:

- Applying for a variance  
WAC 296-900-11005.
- Interim orders  
WAC 296-900-11010.
- Renewing a temporary variance  
WAC 296-900-11015.
- Changing a variance  
WAC 296-900-11020.
- Variance hearings  
WAC 296-900-11025.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-110, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-11005 Applying for a variance.**

**IMPORTANT:**

- A variance provides an approved alternative to WISHA requirements to protect employees from a workplace hazard. Variances can be permanent or temporary.
- Variances will **not** be retroactive. Employers are obligated to follow WISHA requirements until the variance is granted.

**You must:**

- Follow steps 1-5 to apply for a variance when you wish to use an alternative to WISHA requirements as a means to protect your employees.

- Step 1: Decide what type of variance is needed by reviewing the types of variances in Table 1, Requesting a Variance.

Step 2: Complete a written application for the variance, following the requirements in Table 1, Requesting a Variance.

- Note:**
- A form, Variance Application (F414-021-000), is available for requesting variances:
    - From any L&I office.
    - On our web site under Safety Forms, Variance Application <http://www.lni.wa.gov/FormPublications/TablesForms/Safety/SafetyHealth.asp>

**Reference:** • For a list of the local L&I offices, see the resources section of the Safety and health core rules, chapter 296-800 WAC.

Step 3: Notify employees before submitting any type of variance request by doing all of the following:

- Posting a copy of the request on your safety bulletin board.
- Using other appropriate means for notifying employees who may not be expected to receive notices posted on the safety bulletin board. For example, provide a copy to a designated representative or the safety committee.

Step 4: Submit the written request, using one of the following means:

- Mail to:  
Assistant Director  
WISHA Services  
P.O. Box 44650  
Olympia, WA 98504-4650
- Fax to: 360-902-5438
- Take to any L&I office.

Step 5: After receiving a written decision from WISHA about your request, immediately notify affected employees of the decision by using the methods in Step 3.

**You must:**

- Follow the specific requirements of the variance that WISHA has granted.

- Note:**
- If employers fail to follow Steps 1-5 above, the variance cannot be granted.
  - Citations may be issued for failing to follow a variance.
  - Employers can always follow the original WISHA requirements instead of the variance requirements.
  - If your variance is no longer necessary and you decide to follow the WISHA requirements instead, please advise WISHA in writing.

**Table 1  
Requesting a Variance**

<b>For this type of variance:</b>	<b>Include the following on your written application:</b>
<p><b>Permanent variance</b></p> <ul style="list-style-type: none"> <li>– Request a permanent variance if you can show that you will be providing alternate methods of protecting employees from hazards that are as effective as those provided by the requirements from which you are requesting relief.</li> </ul>	<ul style="list-style-type: none"> <li>• Employer name and address</li> <li>• Employer or employer representative signature</li> <li>• Work locations and situations that apply to the variance</li> <li>• Which specific requirements you want to vary from, with WAC numbers</li> <li>• Description of proposed alternative methods of protection, and how they will protect employees.</li> <li>• How employees will be notified:</li> </ul>
<b>Note:</b>	

**Table 1  
Requesting a Variance**

<b>For this type of variance:</b>	<b>Include the following on your written application:</b>
<ul style="list-style-type: none"> <li>• A permanent variance remains in effect unless WISHA modifies or revokes it. Examples of reasons a variance might be revoked include:                             <ul style="list-style-type: none"> <li>– An employer requests the variance be revoked</li> <li>– Requirements that existed when the variance was approved are modified</li> <li>– The work location is changed</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>– About the variance request, as required in Step 2</li> <li>– That they may request a hearing</li> <li>• The following notice on the first page of your posted application, written in large and clear enough print to be easily read: "Attention Employees: Your employer is applying to WISHA for a variance from safety and health requirements. You have a right to ask WISHA for a hearing on the variance request, but you must ask for the hearing in writing by (date*). If no hearing is requested, WISHA will act on the variance request without a hearing." *This date must be 21 calendar days after the variance request is mailed or delivered.</li> </ul>
<p><b>Temporary variance</b></p> <p>Request a temporary variance if both of the following apply:</p> <ul style="list-style-type: none"> <li>• New WISHA requirements can't be met for any of the following reasons:                             <ul style="list-style-type: none"> <li>– Professional or technical people are not available</li> <li>– Materials or equipment are not available</li> <li>– Construction or alteration of facilities cannot be completed by the effective date of the requirements</li> </ul> </li> <li>• You have an effective plan for meeting WISHA requirements as soon as possible.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide all the information required above for permanent variances</li> <li>• Also provide all of the following:                             <ul style="list-style-type: none"> <li>– An explanation of why WISHA requirements can't be met, including documentation that supports this belief</li> <li>– Steps that will be taken to protect employees until WISHA requirements can be met</li> <li>– When WISHA requirements will be met</li> <li>– A statement that this request is from a qualified person who has first hand knowledge of the facts represented</li> </ul> </li> </ul>

**Table 1  
Requesting a Variance**

For this type of variance:	Include the following on your written application:
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Temporary variances remain in effect:                             <ul style="list-style-type: none"> <li>– Until current WISHA requirements are met</li> <li>– No longer than one year, unless extended</li> </ul> </li> </ul>	

**What to expect from WISHA:**

- A review of all variance requests.
  - If more information is needed to make a decision, WISHA may:
    - Contact you or others who may have the needed information.
    - Visit your workplace after contacting you to make arrangements.
    - Deny your request if you don't provide information needed to make a decision on it.
      - A decision at least twenty-one calendar days from when the request was posted for employees.
        - The twenty-one-day period allows employees time to request a hearing on your variance application. See Variance hearings, WAC 296-900-11025.
      - A written decision either granting or denying the variance.
        - If granted, the written decision will include all of the following:
          - The requirement for which the variance applies.
          - The locations where the variance applies.
          - What you must do as an alternative means of protecting employees.
          - The effective date of the variance.
          - An expiration date for the variance, if applicable.
          - The requirement to post the decision.
        - If denied, the written decision will include:
          - A brief statement with reasons for the denial.
          - The requirement to post the decision.
- WISHA will review permanent variances periodically after they have been in effect for six months, to decide whether they are still needed or need to be changed.

**Note:** If there's an appealed WISHA citation and notice that relates to the variance request, the decision on the variance may be delayed until the appeal is resolved.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-11005, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-11010 Interim orders.**

**Definition:**

An interim order allows an employer to vary from WISHA requirements until a permanent or temporary variance is granted.

**You must:**

- Request an interim order if alternate methods of protecting employees are needed while waiting for a permanent or temporary variance.

**Note:** An interim order may be requested at the same time a permanent or temporary variance is requested, or anytime after that.

**What to expect from WISHA:**

- A review of the request for an interim order.
  - If more information is needed to make a decision, WISHA may:
    - Contact the employer or others who may have the needed information.
    - Visit the workplace after contacting the employer to make arrangements.
    - Deny the request if the employer doesn't provide information needed to make a decision.
      - A decision at least twenty-one calendar days from when the request was posted for employees.
        - The twenty-one-day period allows employees time to request a hearing on your temporary variance renewal. See Variance hearings, WAC 296-900-11025.
      - A written decision either granting or denying the interim order request.
        - If granted, the decision will include all of the following:
          - The requirement for which the interim order applies.
          - The locations where the interim order applies.
          - What you must do as an alternative means of protecting employees.
          - The effective date of the interim order.
          - An expiration date for the interim order.
          - The requirement to post the decision.
        - If denied, the decision will include:
          - A brief statement with reasons for the denial.
          - The requirement to post the decision.
- Note:**
  - WISHA's decision to grant or deny an interim order request will not affect the decision on a permanent or temporary variance request.
  - WISHA may choose to issue an interim order in response to a variance request, even when the interim order wasn't specifically requested.
  - Interim orders are effective until they are revoked, or until the variance request is granted or denied.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-11010, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-11015 Renewing a temporary variance.**

**IMPORTANT:**

Temporary variances can be renewed up to two times, for up to one hundred eighty days each time.

**You must:**

- Apply for a temporary variance renewal at least ninety days before the temporary variance expires.
- Send a letter, explaining why more time is needed to fulfill the current requirements.

**What to expect from WISHA:**

- A review of the temporary variance renewal request.
  - If more information is needed to make a decision, WISHA may:
    - Contact you or others who may have the needed information.
    - Visit your workplace after contacting you to make arrangements.
    - Deny your request if you don't provide information needed to make a decision.
      - A decision at least twenty-one calendar days from when the request was posted for employees.

– The twenty-one-day period allows employees time to request a hearing on your temporary variance renewal. See Variance hearings, WAC 296-900-11025.

- A written decision either granting or denying the temporary variance renewal request.

– If granted, the written decision will include all of the following:

- The requirements for which the temporary variance applies.

- The locations where the temporary variance applies.

- What you must do as an alternative means of protecting employees.

- The effective date of the temporary variance.

- An expiration date for the temporary variance.

- The requirement to post the decision.

– If denied, the written decision will include:

- A brief statement with reasons for the denial.

- The requirement to post the decision.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-11015, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-11020 Changing a variance.**

#### **You, your employees, or their representatives may:**

- Request changes to variances in writing as follows:

– For a permanent variance only after it's been in effect for at least six months.

– For a temporary variance, only when renewing it.

**Note:** ■ After six months, WISHA may initiate changes to a variance if they appear to be warranted.

■ Employers can decide at any time to follow the original requirement, instead of the requested variance.

#### **What to expect from WISHA:**

- A review of your request to change a variance.

– If more information is needed to make a decision, WISHA may:

- Contact you or others who may have the needed information.

- Visit your workplace after contacting you to make arrangements.

- Deny your request for a change if you don't provide information needed to make a decision.

- A decision at least twenty-one calendar days from when the request was posted for employees.

– The twenty-one-day period allows employees time to request a hearing on your request to change a variance. See Variance hearings, WAC 296-900-11025.

- A written decision either granting or denying the change in variance.

– If granted, the written decision will include all of the following:

- The requirements for which the variance applies.

- The locations for which the variance applies.

- What you must do as an alternative means of protecting employees.

- The effective date of the change in variance.

- An expiration date of the variance, if applicable.

- The requirement to post the decision.

– If denied, the written decision will include:

- A brief statement with reasons for the denial.

- The requirement to post the decision.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-11020, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-11025 Variance hearings.**

#### **IMPORTANT:**

- Employers, affected employees, or employee representatives may request a hearing on any of the following:

– Permanent or temporary variance requests.

– Changes to existing variances.

#### **You and your affected employees must:**

- Do all of the following if requesting a variance hearing:

– Put the request in writing and sign it.

– Make sure the request is posted or delivered to the department within twenty-one calendar days from the variance application date, or renewal request date.

– Send the written request to WISHA, using one of the following means:

- Mail to:

Assistant Director

WISHA Services

P.O. Box 44650

Olympia, WA 98504-4650

- Fax to: 360-902-5438

- Take to any L&I office.

#### **You must:**

- Immediately do all of the following when you receive a notice of the hearing from WISHA:

– Post a copy of the notice on the safety bulletin board.

– Give a copy of the notice to affected employees and employee representatives.

– Use any other appropriate means for notifying employees who may not receive notices posted on the safety bulletin board. For example, provide a copy to a designated representative or the safety committee.

#### **What to expect from WISHA:**

- WISHA will do both of the following after receiving a request for a hearing on a variance, change of variance, or temporary variance renewal:

– Within ten days, issue a notice advising all interested parties listed on the application that they have the option to participate in the hearing.

– Provide you with a notice of the hearing at least twenty calendar days before the hearing date.

- A hearing for the variance or variance change will be conducted as follows:

– A WISHA representative will explain WISHA's view of the request for a variance or any proposed change to a variance.

– Employers, employees, or employee representatives will then have an opportunity to explain their views and provide any relevant documents or information.

- Information gathered at the hearing will be used to make a decision about whether to grant or deny the request for a variance or change in variance.

**Note:** • WISHA may record a variance hearing.

• Employers, employees, or employee representatives may request copies of recordings or transcripts of variance hearings at cost.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-11025, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-120 Inspections.**

**Summary:**

- WISHA inspections
- WAC 296-900-12005.
- Inspection techniques
- WAC 296-900-12010.
- Complaints
- WAC 296-900-12015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-120, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-12005 WISHA inspections.**

• WISHA conducts the following types of **programmed** inspections:

- Hazardous workplaces.

WISHA identifies hazardous workplaces using objective criteria and inspection-scheduling systems that may include any of the following factors:

- Type of industry.
- Injury and illness data that identifies hazards.
- Employer's industrial insurance experience.
- Number, type, and toxicity of contaminants in the workplace.
- Degree of exposure to hazards.
- Number of employees exposed.
- Other factors, such as history of employee complaints.

**Note:** WISHA periodically reviews the scheduling systems and may adjust the type or significance of each criteria.

- High hazard industries that include the following:

- Agriculture.
- Asbestos renovation and demolition.
- Construction.
- Electrical utilities and communications.
- Logging.
- Maritime.

• WISHA conducts the following types of **unprogrammed** inspections of workplaces that may be in violation of WISHA safety or health requirements or chapter 49.17 RCW, the Washington Industrial Safety and Health Act. These inspections may focus only on certain areas or processes in a workplace or, depending on initial findings, may be expanded to include the entire workplace. Unprogrammed inspections may occur because of:

- Complaints from current employees or employee representatives who believe they have been exposed to a hazard because of a violation.
- Referrals from anyone, including former employees, who reasonably believes that workers under WISHA jurisdiction are being, or have been, exposed to a hazard because of a violation.
- Workplace deaths, catastrophic events, or serious injury or illness.
- A reason to believe that employees may be in imminent danger of serious injury or death.
- Follow-up inspections to verify that hazards identified in a previous inspection have been corrected.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-12005, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-12010 Inspection techniques.**

- During an inspection, WISHA staff may:

- Take samples, photographs, videotapes, or audiotapes.
- Conduct tests or interviews.
- Ask employees to wear sampling devices.
- Privately question, on or off the worksite, any:
  - Employer.
  - Employer representative.
  - Owner.
  - Operator.
  - Employee.
  - Employee representative.
- Employ any other reasonable investigative techniques.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-12010, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-12015 Complaints.**

**Employees or employee representatives may:**

- File a written complaint if they believe they have been exposed to a hazard that is a violation of WISHA safety and health requirements.

**What to expect from WISHA:**

- After receiving a written complaint from an employee or employee representative, WISHA reviews the allegations and responds according to Table 2, WISHA Responses to Employee Complaints.

**Table 2  
WISHA Responses to Employee Complaints**

<b>For this determination:</b>	<b>WISHA will take the following actions:</b>
The complaint is within WISHA jurisdiction and an inspection doesn't appear to be needed at this time	<ul style="list-style-type: none"> <li>• Call the employer to discuss the complaint</li> <li>• Set a deadline for the employer to respond in writing</li> <li>• Fax or mail a complaint notification letter to the employer. Before the complaint is faxed or mailed, the following names will be removed unless specific permission is given to include them:                             <ul style="list-style-type: none"> <li>– The name of the person submitting the complaint</li> <li>– The names of any employees identified in the complaint</li> </ul> </li> <li>• Evaluate the employer's response, and do one of the following:                             <ul style="list-style-type: none"> <li>– Close the complaint because the issues have been addressed, and send a copy of the employer's response to the person filing the complaint</li> <li>– Inspect the workplace</li> </ul> </li> </ul>

**Table 2**  
**WISHA Responses to Employee Complaints**

<b>For this determination:</b>	<b>WISHA will take the following actions:</b>
	<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• If the complaint is closed and additional information is received from the person filing the complaint disputing the employer's written response, WISHA may schedule an inspection</li> <li>• If the person who filed the original complaint requests in writing that WISHA review a decision not to conduct an inspection, WISHA will review the decision and notify the person in writing of the results</li> <li>• If the person requesting the review is not satisfied with the results of the review, they may request a second review by the assistant director or designee</li> </ul>
<p>The complaint is within WISHA jurisdiction and an inspection needs to be conducted</p>	<ul style="list-style-type: none"> <li>• Conduct an inspection</li> <li>• Issue a citation and notice that shows one of the following:                             <ul style="list-style-type: none"> <li>– Violations found</li> <li>– No violations were found</li> </ul> </li> <li>• Send a letter to the person filing the complaint with inspection results</li> </ul> <p><b>Reference:</b> For citation and notice information, turn to citation and notice, WAC 296-900-130</p>
<p>The complaint is not within WISHA jurisdiction</p>	<ul style="list-style-type: none"> <li>• Send a written response to the person filing the complaint explaining the matter is not within WISHA jurisdiction</li> </ul> <p><b>Note:</b> WISHA may make a referral to the proper authority</p>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-12015, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-130 Citation and notice.**

**Summary:**

**Employer responsibility:**

**To notify employees when a citation and notice is received:**

Citation and notice  
WAC 296-900-13005.

Copies of inspection results  
WAC 296-900-13010.  
Posting citation and notices  
WAC 296-900-13015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-130, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-13005 Citation and notice.**

**Definition:**

A citation and notice is a document issued to an employer notifying them of:

- Inspection results.
- Any specific violations of WISHA safety and health requirements.
- Any monetary penalties assessed.
- Employer certification of correction requirements.
- WISHA will mail a citation and notice to you as soon as possible but not later than six months following any inspection or investigation.

– If violations are found, the citation and notice will include:

- A description of violations found.
  - The amount and type of assessed penalties.
  - The length of time given to correct the violations not already corrected during the inspection.
- If no violations are found, a notice of inspection results will be sent stating that no violations were found or penalties assessed.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-13005, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-13010 Copies of future citation and notices. Employees or their representatives wishing to receive copies of citation and notices during the next twelve months must:**

- Submit a request for copy of citation and notice form to the following:

Department of Labor and Industries  
Standards and Information  
P.O. Box 44638  
Olympia, WA 98504-4638

**Note:** • A request for copy of citation and notice form can be obtained by:  
– Calling 360-902-5553.  
– Contacting the local L&I office.

**Reference:** ■ For a list of the local L&I offices, see the resources section of the Safety and health core rules, chapter 296-800 WAC.

**What to expect from WISHA:**

- WISHA may decide who will receive copies of the citation and notices if more than one employee or employee representative requests a copy.
- WISHA may deny a request for copies of citation and notices if the person filing the request is not an employee or employee representative.
- If WISHA grants the request for copies of citation and notices, the employee or employee representative will:
  - Receive an approval document from WISHA.
  - Receive all citation and notices issued to that employer for the next twelve months.

– Continue receiving citation and notices for an additional twelve months if a one-year extension is requested and approved.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-13010, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-13015 Posting citation and notices.**

**You must:**

- Immediately notify employees of a citation and notice by posting it and any correspondence related to an employee complaint on the safety bulletin board for three working days or until all violations are corrected, whichever time period is longer.

- Use any other appropriate means to notify employees who may receive notices posted on the safety bulletin board.

- Examples of other appropriate means include sending a copy by mail or electronically to any of the following:

- A designated employee representative.
- Safety representatives.
- The safety committee.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-13015, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-140 Monetary penalties.**

**Summary:**

**Employer responsibility:**

To pay monetary penalties if assessed.

**Contents:**

Reasons for monetary penalties

WAC 296-900-14005.

Base penalties

WAC 296-900-14010.

Base penalty adjustments

WAC 296-900-14015.

Increases to adjusted base penalties

WAC 296-900-14020.

**Definition:**

Monetary penalties are fines assessed against an employer for violations of safety and health requirements.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-140, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-14005 Reasons for monetary penalties.**

- WISHA **may** assess monetary penalties when a citation and notice is issued for any violation of safety and health rules or statutes.

- WISHA **will** assess monetary penalties under the following conditions:

- When a citation and notice is issued for a serious, willful, or egregious violation.

- When civil penalties are specified by statute as described in RCW 49.17.180.

**Note:** In addition to penalties specified by WISHA, there are penalties specified by other statutes, such as:

- Asbestos construction projects, RCW 49.26.016.
- Right to know (RTK)—MSDS, RCW 49.70.190.
- Right to know—Penalty for late payment, RCW 49.70.177.

- The minimum civil penalties assessed by WISHA are:

- One hundred dollars for any penalty.

- Five thousand dollars per violation for all willful violations.

- Two hundred fifty dollars per day for asbestos good faith inspection (RCW 49.26.016 and 49.26.013).

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-14005, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-14010 Base penalties.**

- WISHA calculates the base penalty for a violation by considering the following:

- Specific amounts that are dictated by statute;

**OR**

- By assigning a weight to a violation, called "gravity." Gravity is calculated by multiplying a violation's severity rate by its probability rate. Expressed as a formula:

$$\text{Gravity} = \text{Severity} \times \text{Probability}$$

**Note:** Most base penalties are calculated by the gravity method.

- Severity and probability are established in the following ways:

**Severity:**

- Severity rates are based on the most serious injury, illness, or disease that could be reasonably expected to occur because of a hazardous condition.

- Severity rates are expressed in whole numbers and range from 1 (lowest) to 6 (highest). Violations with a severity rating of 4, 5, or 6 are considered serious.

- WISHA uses Table 3, Severity Rates, to determine the severity rate for a violation.

**Table 3  
Severity Rates**

Severity	Most serious injury, illness, or disease from the violation is likely to be:
6	<ul style="list-style-type: none"> <li>• Death</li> <li>• Injuries involving permanent severe disability</li> <li>• Chronic, irreversible illness</li> </ul>
5	<ul style="list-style-type: none"> <li>• Permanent disability of a limited or less severe nature</li> <li>• Injuries or reversible illnesses resulting in hospitalization</li> </ul>
4	<ul style="list-style-type: none"> <li>• Injuries or temporary, reversible illnesses resulting in serious physical harm</li> <li>• May require removal from exposure or supportive treatment without hospitalization for recovery</li> </ul>
3	<ul style="list-style-type: none"> <li>• Would probably not cause death or serious physical harm, but have at least a major impact on and indirect relationship to serious injury, illness, or disease</li> <li>• Could have direct and immediate relationship to safety and health of employees</li> <li>• First aid is the only medical treatment needed</li> </ul>

**Table 3  
Severity Rates**

Severity	Most serious injury, illness, or disease from the violation is likely to be:
2	<ul style="list-style-type: none"> <li>• Indirect relationship to non-serious injury, illness, or disease</li> <li>• No injury, illness, or disease without additional violations</li> </ul>
1	<ul style="list-style-type: none"> <li>• No injury, illness, disease</li> <li>• Not likely to result in injury even in the presence of other violations</li> </ul>

**Probability:**

**Definition:**

A probability rate is a number that describes the likelihood of an injury, illness, or disease occurring, ranging from 1 (lowest) to 6 (highest).

– When determining probability, WISHA considers a variety of factors, depending on the situation, such as:

- Frequency and amount of exposure.
- Number of employees exposed.
- Instances, or number of times the hazard is identified in the workplace.
- How close an employee is to the hazard, i.e., the proximity of the employee to the hazard.
- Weather and other working conditions.
- Employee skill level and training.
- Employee awareness of the hazard.
- The pace, speed, and nature of the task or work.
- Use of personal protective equipment.
- Other mitigating or contributing circumstances.

– WISHA uses Table 4, Gravity Based Penalty, to determine the dollar amount for each gravity-based penalty, unless otherwise specified by statute.

**Table 4  
Gravity Based Penalty**

Gravity	Base Penalty
1	\$100
2	\$200
3	\$300
4	\$400
5	\$500
6	\$1000
8	\$1500
9	\$2000
10	\$2500
12	\$3000
15	\$3500
16	\$4000
18	\$4500
20	\$5000
24	\$5500
25	\$6000
30	\$6500
36	\$7000

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-14010, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-14015 Base penalty adjustments.**

• WISHA may adjust base penalties. Table 5, Adjusted Base Penalties, describes the various factors WISHA considers when adjusting a base penalty, and the effect on the fine.

– The minimum adjusted base penalty for any violation carrying a penalty is one hundred dollars.

– The minimum penalty for willful violations is five thousand dollars.

– The maximum adjusted base penalty for a violation is seven thousand dollars.

• No adjustments are made to minimum penalty amounts specified by statute.

**Note:** Repeat, willful, egregious, or failure-to-abate (failure to correct) penalty adjustments can exceed seven thousand dollars. See Increases to adjusted base penalties, WAC 296-900-14020, for those penalties.

**Table 5  
Adjusted Base Penalties**

For this type of adjustment:	WISHA will consider:	The base penalty will be adjusted as follows:
Good faith effort	<ul style="list-style-type: none"> <li>• Awareness of act</li> <li>• Effort before an inspection to provide a safe and healthful workplace for employees</li> <li>• Effort to follow a requirement they have violated</li> <li>• Cooperation during an inspection, measured by a desire to follow the cited requirement and immediately correct identified hazards</li> </ul>	Excellent rating = 35% reduction  Good rating = 20% reduction  Average rating = No adjustment  Poor rating = 20% increase
Size of workforce	<ul style="list-style-type: none"> <li>• Work force size at all sites in Washington state</li> </ul>	1-25 employees = 60% reduction 26-100 employees = 40% reduction 101-250 employees = 20% reduction More than 250 employees = No adjustment
Employer history	<ul style="list-style-type: none"> <li>• History of previous safety and health violations in Washington state and injury and illness rates for that employer</li> </ul>	Good history = 10% reduction Average history = No adjustment Poor history = 10% increase

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-14015, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-14020 Increases to adjusted base penalties.**

• WISHA may increase an adjusted base penalty in certain circumstances. Table 6, Increases to Adjusted Base Penalties, describes circumstances where an increase may be applied to an adjusted base penalty.

**Table 6  
Increases to Adjusted Base Penalties**

<b>For this circumstance:</b>	<b>The adjusted base penalty may be increased as follows:</b>
Repeat violation When the employer has been previously cited for a substantially similar hazard, with a final order for the previous violation dated no more than 3 years prior to the employer committing the violation being cited.	<ul style="list-style-type: none"> <li>Multiplied by the total number of citations with violations involving similar hazards, including the current inspection.</li> </ul> <p><b>Note:</b> The maximum penalty can't exceed seventy thousand dollars for each violation.</p>
Willful violation  An act committed with the intentional, knowing, or voluntary disregard for the WISHA requirements or with plain indifference to employee safety.	<ul style="list-style-type: none"> <li>Multiplied by ten with at least the statutory minimum penalty of five thousand dollars</li> </ul> <p><b>Note:</b> The maximum penalty can't exceed \$70,000 for each violation.</p>
Egregious violation If the violation was willful and at least one of the following:  <ul style="list-style-type: none"> <li>The violations resulted in worker fatalities, a worksite catastrophe, or a large number of injuries or illnesses.</li> <li>The violations resulted in persistently high rates of worker injuries or illnesses.</li> <li>The employer has an extensive history of prior violations.</li> <li>The employer has intentionally disregarded its safety and health responsibilities.</li> <li>The employer's conduct taken as a whole amounts to clear bad faith in the performance of his/her duties.</li> <li>The employer has committed a large number of violations so as to undermine significantly the effectiveness of any safety and health program that might be in place.</li> </ul>	<ul style="list-style-type: none"> <li>With a separate penalty issued for each instance the employer fails to follow a specific requirement.</li> </ul>

**Table 6  
Increases to Adjusted Base Penalties**

<b>For this circumstance:</b>	<b>The adjusted base penalty may be increased as follows:</b>
Failure to abate (FTA) Failure to correct a cited WISHA violation on time. <b>Reference:</b> For how to certify corrected violations, go to Certifying violation corrections, WAC 296-900-60005 through 296-900-60035.	<ul style="list-style-type: none"> <li>Based on the facts at the time of reinspection, will be multiplied by:                             <ul style="list-style-type: none"> <li>At least five, but up to ten, based on the employer's effort to comply.</li> <li>The number of calendar days past the correction date, with a minimum of five days.</li> </ul> </li> </ul> <p><b>Note:</b> The maximum penalty can't exceed seven thousand dollars per day for every day the violation is not corrected.</p>

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-14020, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-150 Certifying violation corrections.**

**Summary:**

Employer responsibility:

- To certify that violations to safety and health requirements have been corrected.
- To submit, if required:
  - Additional information.
  - Correction action plans.
  - Progress reports.
- To comply with correction due dates.
- To tag cited moveable equipment to warn employees of a hazard.
- To inform affected employees that each violation was corrected.

Certify violation correction

WAC 296-900-15005.

Violation correction action plans

WAC 296-900-15010.

Progress reports

WAC 296-900-15015.

Timeliness of violation correction documents

WAC 296-900-15020.

Inform employees about violation correction

WAC 296-900-15025.

Tag moveable equipment

WAC 296-900-15030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-150, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-15005 Certifying violation correction.**

**Definition:**

A correction date is the date by which you must meet the WISHA requirements listed on either a:

- Citation and notice (C&N);

**OR**

- A corrective notice of redetermination (CNR).

**You must:**

- Certify in writing within ten calendar days following the correction date shown on the C&N that each violation has been corrected. Include the following:
  - Employer name and address.
  - The inspection number involved.
  - The citation and item numbers which have been corrected.
  - The date each violation was corrected and the method used to correct them.
  - A statement that both:
    - Affected employees and their representatives were informed that each violation was corrected;

**AND**

- The information submitted is accurate.

- Employer's signature or the signature of employer's designated representative.

**Note:** Certification is not required if the WISHA compliance officer indicates in the C&N, or a reassumption hearings officer indicates in a CNR, that they have already been corrected.

**You must:**

- Submit additional documentation for willful or repeated violations, demonstrating that they were corrected. This documentation may include, but is not limited to:
  - Evidence of the purchase or repair of equipment.
  - Photographic or video evidence of corrections.
  - Other written records.
- Submit additional documentation for serious violations when required in the C&N or CNR.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-15005, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-15010 Violation correction action plans.****You must:**

- Submit a written violation correction action plan within twenty-five calendar days from the final order date when the citation and notice or corrective notice of redetermination requires it. Include all of the following in the violation correction action plan:
  - Identification of the violation.
  - The steps that will be taken to correct the violation.
  - A schedule to complete the steps.
  - A description of how employees will be protected until the corrections are completed.

**What to expect from WISHA:**

- WISHA will notify you in writing only if your plan is not adequate, and describe necessary changes.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-15010, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-15015 Progress reports.****You must:**

- Submit written progress reports on corrections when required in the citation and notice (C&N) or corrective notice of redetermination (CNR), and briefly explain the:
  - Status of each violation.
  - Action taken to correct each violation.

- Date each action has or will be taken.

**What to expect from WISHA:**

- WISHA will state in the C&N or CNR if progress reports are required, including:
  - Items that require progress reports.
  - Date when an initial progress report must be submitted. The initial progress report is due no sooner than thirty calendar days after you submit a correction action plan.
  - Whether additional progress reports are required, and the dates by which they must be submitted.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-15015, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-15020 Timeliness of violation correction documents.****What to expect from WISHA:**

- WISHA will determine the timeliness of violation correction documents by reviewing the following:
  - The postmark date for documents sent by mail.
  - The date received by other means, such as personal delivery or fax.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-15020, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-15025 Inform employees about violation correction.****You must:**

- Inform employees about violation corrections by doing the following:
  - Post a copy of each violation correction document submitted to WISHA, or a summary, near the place where the violations occurred, if practical.
    - If posting near the place where the violation occurred is not practical, such as with a mobile work operation, post in a place readily accessible to affected employees or take other steps to fully communicate actions taken to affected employees or their representatives.

- Keep violation correction information posted for at least three working days after submitting the correction documents to WISHA.

- Give notice to employees and their representatives on or before the date you submit correction information to WISHA.

- Make sure that all posted correction documents are not altered, defaced, or covered by other materials.

- Inform employees and their representatives of their right to examine and copy all correction documents submitted to WISHA.

- If they ask to examine or copy documents within three working days of receiving notice that the documents were submitted to WISHA, provide access or copies no later than five days after receiving their request.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-15025, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-15030 Tag moveable equipment.****You must:**

- Tag moveable equipment that has been cited to warn employees if a hazard has not been corrected, as follows:

– Attach a warning tag or a copy of the citation to the equipment's operating controls or to the cited component.

■ For hand-held equipment, tag it immediately after you receive a citation.

■ For other equipment, tag it before moving it within the worksite or between worksites.

**Note:** The tag should warn employees about the nature of the violation and tell them where the citation is posted.

**Reference:** For a sample tag that meets this requirement, go to helpful tools, sample tag for cited moveable equipment, in the resources section of this chapter.

**You must:**

- Make sure that the tag or copy of the citation attached to movable equipment is not altered, defaced, or covered by other materials.

- Keep the tag or copy of the citation attached to movable equipment until one of the following occurs:

- Violations have been corrected and all certification documents have been submitted to WISHA.

- Cited equipment is permanently removed from service.

- The final order from an appeal vacates (voids) the violation.

**Note:** Safety standards for construction work, chapter 296-155 WAC, has information on warning tags. You can use warning tags that meet those requirements instead of the warning tags required by this rule.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-15030, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-160 More time to comply.**

**Summary:**

**Your responsibility:**

To submit timely requests when more time is needed to correct violations. To post requests for more time for employees.

Requesting more time to comply

WAC 296-900-16005.

Post WISHA's response to requests for more time

WAC 296-900-16010.

Correction date hearing requests

WAC 296-900-16015.

Post WISHA's violation correction hearing notice

WAC 296-900-16020.

Violation correction hearing procedures

WAC 296-900-16025.

Post the violation correction hearing decision

WAC 296-900-16030.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-160, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-16005 Requesting more time to comply.**

**IMPORTANT:**

- Employers can request more time to correct violations if they:

- Have made a good faith effort to correct the violation.

- Have not corrected the violation because of factors beyond their control.

**You must:**

- Submit any requests for more time to correct violations in writing. Requests must be received or postmarked before midnight of the correction date shown on the citation and

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notice (C&N) or corrective notice of redetermination (CNR), and include:

- The business name.

- The address of the workplaces.

- The citation and the correction dates to be extended.

- The new correction date and length of correction period being requested.

- A description of the actions that have been, and are being, taken to meet the correction dates in the C&N or CNR.

- Factors preventing correction of violations by the date required.

- The means that will be used to protect employees while the violation is being corrected.

- Certification that the request for correction date extension has been posted, and if appropriate, certification that a copy was delivered to affected employees or their representatives.

- Employer's signature or the signature of the employer's representative.

- Date.

- Submit requests by one of the following methods:

- First class mail, postage prepaid to any L&I office.

- Take to any L&I office.

- Fax to the number shown in the C&N.

**Reference:** For a list of the local offices, see the resources section of the Safety and health core rules, chapter 296-800 WAC.

**What to expect from WISHA:**

• **WISHA may:**

- Accept late requests if they are both:

- Received within five days following the related correction date;

**AND**

- Accompanied by your written statement explaining the exceptional circumstances that caused the delay.

**Note:** WISHA doesn't accept late requests when compliance activity has already started.

• **WISHA may:**

- Respond to telephone requests or personal conversations asking for more time to comply if timely, and followed up in writing within twenty-four hours.

- Conduct an investigation before making a decision whether to grant a request for more time.

• **WISHA will:**

- Make a decision whether or not to grant the employer more time. Once made, the decision remains in effect unless an employee or employee representative requests a hearing.

- Keep the original correction date in effect unless a notice granting more time is sent.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-16005, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-16010 Post WISHA's response to requests for more time.**

**You must:**

- Post notices from WISHA approving additional time to correct citations, with the related citation, immediately upon receipt.

- Keep the notices posted until one of the following occur:

- The correction date has passed.

- A hearing notice is requested and posted.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-16010, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-16015 Correction date hearing requests.**

#### **IMPORTANT:**

- Affected employees or their designated representatives may request a hearing if they disagree with WISHA's decision to grant an employer more time to correct a violation.
- Employers may request a hearing if WISHA denies their request for more time to correct a violation.

#### **You, your employees, or their representatives must:**

- Send requests for hearings, if desired, in writing no later than ten calendar days after the issue date of the notice granting more time to correct a violation to:

– Mail to:

Assistant Director for WISHA Services  
Attn: WISHA Appeals  
P.O. Box 44604  
Olympia, WA 98504-4604

– Fax to: 360-902-5581

– Take to any department service location.

**Reference:** For a list of the local offices, see the resources section of the Safety and health core rules, chapter 296-800 WAC.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-16015, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-16020 Post WISHA's violation correction hearing notice.**

#### **You must:**

- Post WISHA's hearing notice or a complete copy until the hearing is held, along with the:
  - Citation containing the correction date for which more time was requested.
  - Department notices issued in response to the employer's request for more time.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-16020, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-16025 Violation correction hearing procedures. What to expect from WISHA:**

- After receiving a hearing request, the assistant director for WISHA services will appoint someone from WISHA to act as a hearings officer.
- The hearings officer:
  - Will send a hearing notice to the employer and employee at least twenty days before the hearing date that includes all of the following:
    - A statement that all interested parties can participate in the hearing.
    - The time, date, and place of the hearing.
    - A short and clear explanation why a hearing was requested.
    - The nature of the proceeding, including the specific sections of the statute or rule involved.
    - The legal authority and jurisdiction under which the hearing will be held.
  - May discuss the material to be presented to determine how the hearing will proceed.

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- An assistant attorney general may be present at the hearing to give legal advice to the hearings officer.
- The hearing will be conducted by either:
  - The hearings officer;
- OR**
- The assistant attorney general, if requested by the hearings officer.
- After the hearing, WISHA will issue an order that either affirms or modifies the correction date that caused the hearing.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-16025, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-16030 Post the violation correction hearing decision.**

#### **You must:**

- Post a complete, unedited copy of the order affirming or modifying the correction date as soon as it is received, along with the applicable citation.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-16030, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-170 Appeals.**

#### **Summary:**

#### **Employer responsibility:**

#### **To post information regarding appeals in a conspicuous area where notices to employees are normally posted:**

Appealing a citation and notice (C&N)

WAC 296-900-17005.

Appealing a corrective notice of redetermination (CNR)

WAC 296-900-17010.

Posting appeals

WAC 296-900-17015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-170, filed 2/21/06, effective 6/1/06.]

### **WAC 296-900-17005 Appealing a citation and notice (C&N).**

#### **IMPORTANT:**

- Employers may appeal C&Ns.
- Employees of the cited employer, or their designated representatives, may only appeal correction dates.

#### **You must:**

- When appealing, submit a written appeal to WISHA within fifteen working days after receiving the C&N. Include the following information:
  - Business name, address, and telephone number.
  - Name, address, and telephone number of any employer representative.
  - C&N number.
  - What you believe is wrong with the C&N and any related facts.
  - What you believe should be changed, and why.
  - A signature and date.
- Send appeals in any of the following ways:
  - Mail to:

Assistant Director for WISHA Services  
Attn: WISHA Appeals  
P.O. Box 44604  
Olympia, WA 98504-4604

- Fax to: 360-902-5581
- Take to any department service location.

**Reference:** See the resources section of the Safety and health core rules, chapter 296-800 WAC, for a list of the local offices.

**Note:** The postmark is considered the submission date of a mailed request.

**Employees or their designated representatives must:**

- When appealing C&N correction dates, submit a written request to WISHA within fifteen working days after the C&N is received. Include the following information:

- Name of employee, address, telephone number.
- Name, address, and telephone number of any designated representative.
- C&N number.
- What is believed to be wrong with the correction date.
- A signature and date.

- Send appeals in any of the following ways:
- Mail to:

Assistant Director for WISHA Services

Attn: WISHA Appeals

P.O. Box 44604

Olympia, WA 98504-4604

– Fax to: 360-902-5581

– Take to any L&I service location.

**Reference:** See the resources section of the Safety and health core rules, chapter 296-800 WAC, for a list of the local offices.

**Note:** The postmark is considered the submission date of a mailed request.

What to expect from WISHA:

- After receiving an appeal, WISHA will do one of the following:
  - Reassume jurisdiction over the C&N, and notify the person who submitted the appeal.
  - Forward the appeal to the board of industrial insurance appeals. The board will send the person submitting the appeal a notice with the time and location of any board proceedings.

**Definition:**

Reassume jurisdiction means that WISHA has decided to provide the employer with an informal conference to discuss their appeal.

- When reassuming jurisdiction over a C&N, WISHA has thirty working days after receiving the appeal to review it, gather more information, and decide whether to make changes to the C&N. The review period:

- Begins the first working day after the appeal is received. For example, if an appeal is received on Friday, the thirty days will begin on the following Monday unless it is a state holiday.

- May be extended fifteen additional working days, if everyone involved agrees and signs an extension agreement within the initial thirty-day period.

- Will include an informal conference about the appeal that is an opportunity for interested parties to:

- Briefly explain their positions.
- Provide any additional information they would like WISHA to consider when reviewing the C&N.

**Note:** WISHA might reassume jurisdiction over a C&N to do any of the following:

- Provide an employer and affected employees an opportunity to present relevant information, facts, and opinions during an informal conference.

- Give an employer, affected employees, and the department an opportunity to resolve appeals rapidly and without further contest, especially in routine compliance cases.

- Educate employers about the C&N, the WISHA appeals process, and WISHA compliance.

- Review citations, penalties, and correction dates. Although informal, the conference is an official meeting and it may be either partially or totally recorded. Participants will be told if the conference is recorded.

- On or before the end of the thirty working day review period, WISHA will issue a corrective notice of redetermination that:

- Reflects any changes made to the C&N.
- Is sent to the employer, employees, and employee representatives participating in the appeal process.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-17005, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-17010 Appealing a corrective notice of redetermination (CNR).**

**IMPORTANT:**

- Employers may appeal CNRs.
- Employees who could be affected by a CNR, or their designated representatives, may appeal correction dates.

**Employees or their representatives must:**

- Appeal a CNR, if desired, in writing within fifteen working days after it was received to the:

Board of Industrial Insurance Appeals

2430 Chandler Court S.W.

P.O. Box 42401

Olympia, WA 98504-2401

- Send a copy of the appeal to the CNR to the:

Assistant Director for WISHA Services

Attn: WISHA Appeals

P.O. Box 44604

Olympia, WA 98504-4604

– Fax to: 360-902-5581

– Take to any department service location.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-17010, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-17015 Posting appeals.**

**You must:**

- Immediately post notices and information related to any appeal in the same place where WISHA citation and notices (C&Ns) are posted. These notices and information include:

- The notice of appeal, until the appeal is resolved.
- Notices about WISHA reassuming jurisdiction, and any extension of the review period until the end of review period.

- A notice of an informal conference until after the conference is held.

- A corrective notice of redetermination for as long as C&Ns are to be posted.

**Reference:** For C&N posting requirements, see Posting citation and notices, WAC 296-900-13015.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-17015, filed 2/21/06, effective 6/1/06.]

**WAC 296-900-180 Definitions.****Affected employees**

Employees who could be one of the following:

- Exposed to unsafe conditions or practices.
- Affected by a request for, or change in, a variance from WISHA requirements.

**Assistant director**

The assistant director for the WISHA services division at the department of labor and industries or his/her designated representative.

**Board**

The board of industrial insurance appeals.

**Certification**

An employer's written statement describing when and how a citation violation was corrected.

**Citation**

See citation and notice.

**Citation and notice**

Issued to an employer for any violation of WISHA safety and health requirements. Also known as a citation and notice of assessment, or simply citation.

**Correction action plans**

Your written plans for correcting a WISHA violation.

**Correction date**

The date by which you must meet the WISHA requirements listed on either a:

- Citation and notice (C&N);

**OR**

- A Corrective notice of redetermination (CNR).

**Corrective notice of redetermination (CNR)**

Issued by WISHA after WISHA has reassumed jurisdiction over an appealed citation and notice.

**Designated representative**

Any of the following:

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written employee authorization.
- The legal representative of a deceased or legally incapacitated employee.

**Documentation**

Material that an employer submits to prove that a correction is completed. Documentation includes, but is not limited to, photographs, receipts for materials and labor.

**Failure to abate (FTA)**

A violation that was cited previously which the employer has not fixed.

**Final order**

Any of the following (unless an employer or other party files a timely appeal):

- Citation and notice.
- Corrective notice of redetermination.
- Decision and order from the board of industrial insurance appeals.
- Denial of petition for review from the board of industrial insurance appeals.
- Decision from a Washington state superior court, court of appeals, or the state supreme court.

**Final order date**

The date a final order is issued.

**Hazard**

Any condition, potential or inherent, which can cause injury, death, or occupational disease.

**Imminent danger violation**

Any violation resulting from conditions or practices in any place of employment, which are such that a danger exists which could reasonably be expected to cause death or serious physical harm, immediately or before such danger can be eliminated through the enforcement procedures otherwise provided by the Washington Industrial Safety and Health Act.

**Interim order**

An order allowing an employer to vary from WISHA requirements until a permanent or temporary variance is granted.

**Monetary penalties**

Fines assessed against an employer for violations of safety and health requirements.

**Movable equipment**

A hand-held or nonhand-held machine or device that:

- Is powered or nonpowered.
- Can be moved within or between worksites.

**Must**

Means mandatory.

**Permanent variance**

Allows an employer to vary from WISHA requirements when an alternate means, that provides equal protection to workers, is used.

**Probability rate**

A number that describes the likelihood of an injury, illness, or disease occurring, ranging from 1 (lowest) to 6 (highest).

**Reassume jurisdiction**

WISHA has decided to provide the employer with an informal conference to discuss their appeal.

**Repeat violation**

A violation where the employer has been cited one or more times previously for a substantially similar hazard, and the prior violation has become a final order no more than three years prior to the employer committing the violation being cited.

**Serious violation**

When there is a substantial probability that death or serious physical harm could result from one of the following in the workplace:

- A condition that exists.
- One or more practices, means, methods, operations, or processes that have been adopted or are in use.

**Temporary variance**

Allows an employer to vary from WISHA requirements under certain circumstances.

**Variance**

Provides an approved alternative to WISHA requirements to protect employees from a workplace hazard. Variances can be permanent or temporary.

**WAC**

An acronym for Washington Administrative Code, which are rules developed to address state law.

**WISHA**

This is an acronym for the Washington Industrial Safety and Health Act.

**You**  
An employer.

**Sample Tag for Cited Moveable Equipment**

<p><b>WARNING: EQUIPMENT HAZARD</b></p> <p>Cited by the <b>Department of Labor and Industries</b></p>	Equipment cited:
	Hazard cited:
	For detailed information, see L&I citation posted at:

<p><b>WARNING: EQUIPMENT HAZARD</b></p> <p><b>See reverse side</b></p>	<p>This tag or similar tag or a copy of the citation must remain attached to this equipment until the criteria for removal in WAC 296-900-15035 are met.</p> <p>The tag/citation copy must not be altered, defaced, or covered by other material.</p>
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[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. 06-06-020, § 296-900-180, filed 2/21/06, effective 6/1/06.]